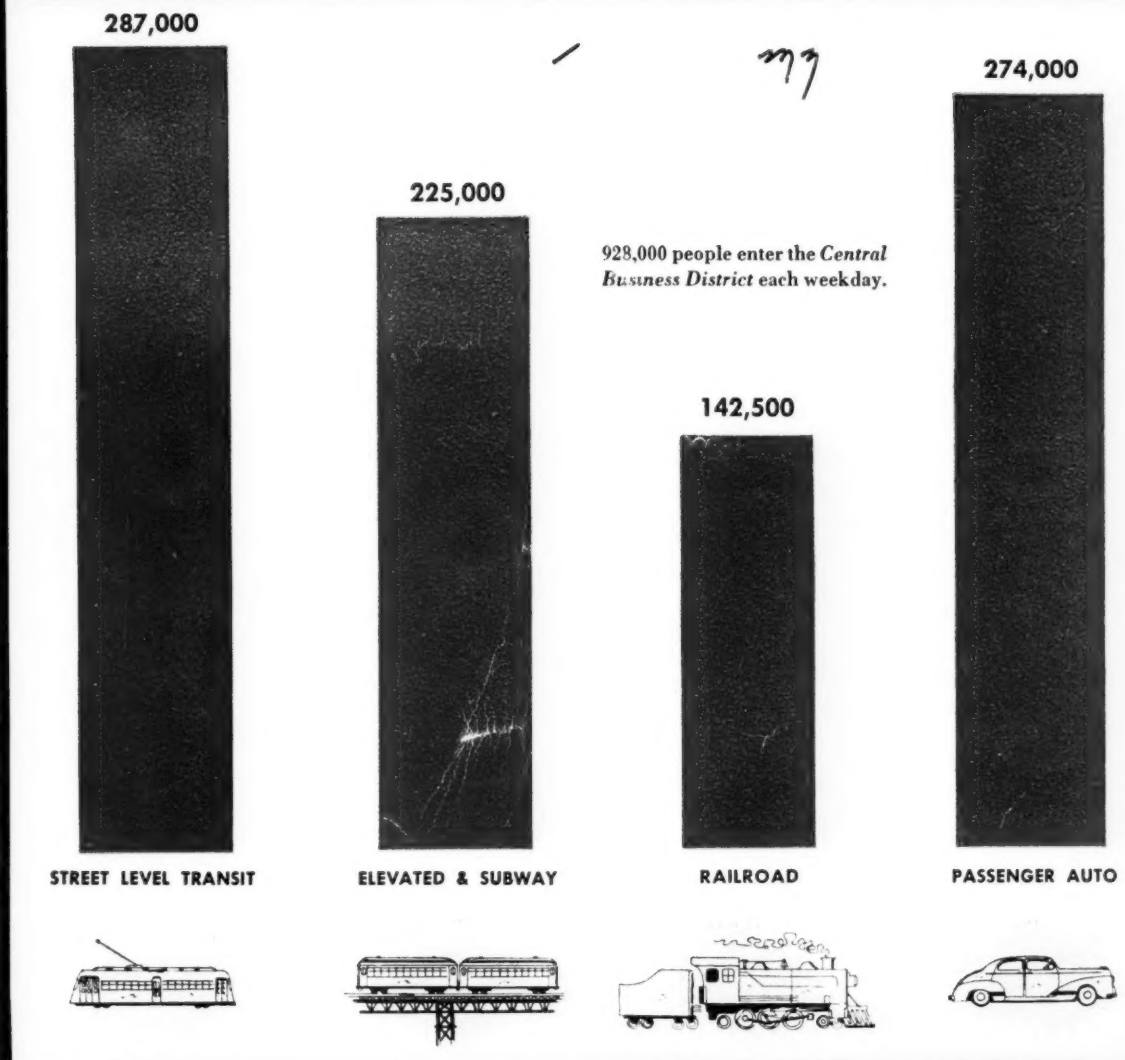
TECHNOLOGY DEPT.

Midwest Engineer

SERVING THE ENGINEERING PROFESSION



HOW PEOPLE TRAVEL TO CHICAGO'S CENTRAL BUSINESS DISTRICT

WSE Meetings—Page 2

Vol. 3 MAY, 1950 No. 9

WESTERN SOCIETY OF ENGINEERS FOUNDED 1869

ILLINOIS POWER COMPANY
Wood River Power Station
WOOD RIVER, ILLINOIS
SARGENT & LUNDY,
Chicago, Ill., Engineers
May - 1950
Sun Mon Tue Wed Thu Fri Sat
1 2 3 4 5 6
7 8 9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31
STRUCTURAL STEEL FABRICATED BY
MISSISSIPPI VALLEY
STRUCTURAL STEEL CO.
CHICAGO DECATUR ST. LOUIS FLINT

HORTON WATERSPHERE

The Watersphere is a modern, streamlined elevated water tank of welded construction. It is used to provide gravity water pressure for general service and fire protection in municipal and private water systems.

This welded steel tank will blend in with the most progressively designed industrial plant as well as fit into any location in a municipal water system. The column supporting the Watersphere has graceful, sweeping lines from top to bottom. The flared base of the column rests on, and is anchored to, a circular concrete foundation.

Installations for municipal service are built in accordance with American Water Works Association specifications and those for automatic sprinkler service meet fire insurance underwriters' requirements.

Waterspheres have been built in capacities from 25,000 to 250,000 gals. and up to 120 ft. to the bottom of the water capacity. Write our nearest office for complete information.

Left: 100,000-gal. Horton Watersphere providing gravity pressure in the water distribution system at Fort Branch, Ind. It is 100 feet to the bottom.

CHICAGO BRIDGE & IRON COMPANY

Atlanta, Birmingham, Boston, Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Salt Lake City, San Francisco, Seattle, Tulsa

Plants at BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

GENERAL AND EDITORIAL OFFICES
HEADQUARTERS OF
WESTERN SOCIETY OF ENGINEERS
84 E. RANDOLPH STREET
CHICAGO 1, ILLINOIS
TELEPHONE: RANDOLPH 6—1736

Gustav Egloff.....*President*
H. P. Sedwick.....*1st Vice President*
J. C. Witt.....*2nd Vice President*
Donald N. Becker.....*Treasurer*
Chas. E. DeLeuw.....*Trustee, One Year*
Eldon W. Imhoff.....*Trustee, One Year*
Wilfred Sykes.....*Trustee, Two Years*
F. T. Whiting.....*Trustee, Two Years*
Leroy F. Bernhard.....*Trustee, Three Years*
Ludwig Skog.....*Trustee, Three Years*
W. V. Kahler.....*Past President*
Verne O. McClurg.....*Past President*
J. Earl Harrington.....*Executive Secretary*
A. W. Howson.....*Chairman, Publications Committee*

J. EARL HARRINGTON
Editor and Business Manager

BARBARITA M. ANDREWS
Managing Editor

MIDWEST ENGINEER
Published Monthly
except June, July, August by
THE WESTERN
SOCIETY OF ENGINEERS
at
2207 Dodge Avenue
Evanston, Illinois

The Society does not assume responsibility for statements and opinions in articles, papers and discussions appearing herein. All material must be submitted on or before the 10th of the month prior to date of publication.

Copyright 1950 by the
WESTERN SOCIETY OF
ENGINEERS

Permission is given for the reproduction of any material herein, provided due credit is given.

Single copy ..... $ .35
Annual subscription 3.00
Foreign subscription 4.00

Entered as second-class matter September 23, 1948 at the post office at Evanston, Illinois under the Act of March 3, 1879.

MIDWEST ENGINEER

A Publication of the

WESTERN SOCIETY OF ENGINEERS

Serving the Engineering Profession

May, 1950 Vol. 2, No. 9

CONTENTS

Improving Traffic Movement In Chicago's Central Business District 3
Unification of Railroad Passenger Facilities 5
WSE's Annual June Dinner 9
Americanized Prestressed Concrete 11
Membership Drive 14
First Annual Golf Tournament 21
WSE Announces New Officers for 1950-51 23
May Advertisers 28
WSE Applications 29
Reviews of Technical Books 30
Engineering Societies Personnel Service 32

COVER CREDIT

Our May cover is one of the illustrations from the study conducted and just released by The Mayor's Traffic Survey Committee for the Central Business District, of the City of Chicago.

May 8, Trucks on Highways

SPONSORED BY THE TRANSPORTATION ENGINEERING SECTION

"Are highway trucking companies paying a fair share of highway construction and maintenance costs? That is the subject of the WSE meeting Monday, May 8.

At present this question is the center of a heated controversy. Many persons, particularly railroad men, are asserting that the taxes paid by trucking concerns are inadequate to compensate for the use these companies are making of the public highways. Representatives of the trucking interests strongly deny these charges. At this meeting two speakers will present the arguments on both sides of this question.

Col. John W. Wheeler, executive assistant, Chicago Burlington & Quincy Railroad, will present:

THE CASE AGAINST THE TRUCKS

while Chester G. Moore, chairman of the board of directors, Central Motor Freight Association, and Secretary of the American Trucking Association, will present:

THE CASE FOR THE TRUCKS

Each speaker will have 20 minutes in which to make his initial statement after which each will have 10 minutes for rebuttal. Don't miss this interesting meeting on a subject of wide public interest.

May 15, Visit to Naval Exhibit

SPONSORED BY THE PROFESSIONAL WOMEN'S COUNCIL—FOR ALL WSE MEMBERS

The Professional Women's Council of WSE has arranged an excursion to the Museum of Science and Industry, which will start promptly at 6:30 p.m., with dinner in the dining room of the museum. Dinner will be $1.75. (Reservations should be telephoned to WSE—RAndolph 6-1736—but ticket is paid for at the dinner.)

Capt. K. J. Biederman

Comdr. G. H. Laird, Jr., executive officer of the plant, will act as master of ceremonies for the Navy, introducing the speakers who will comment briefly.

Earl Janson, industrial manager, will speak generally on operations of the torpedo plant at Forest Park in wartime and today.

Lt. Comdr. G. K. Nicodemus, Jr., U.A.B. industrial officer, will be the second speaker. With the tracing of the Mark 18 as a backdrop, he will explain functions of the torpedo, its use in World War II, and new developments.

Capt. K. J. Biederman, USN, commanding officer of the plant, will talk on Armed Forces Day, unification progress, and other subjects, and extend an invitation to attend "open house" at the plant on Armed Forces Day.

Major Lohr, head of the museum, will be introduced and speak briefly.

Following the tour of the naval exhibit, the museum has arranged a short tour through some of the most interesting of the other exhibits. The museum will close at 9 p.m.

May 22, Amateur Motion Pictures

SPONSORED BY MECHANICAL ENGINEERING, FIRE PROTECTION & SAFETY ENGINEERING SECTIONS

R. H. Unseld, Sales Manager, Bell & Howell, will speak Monday, May 22, on the subject "Amateur Motion Pictures." He will review the history of motion pictures from the year 1600 B.C., and will illustrate uses of telephoto lenses for enlarging nearby subjects, in an original color film entitled "Swamp Song." Unseld will describe camera tricks without the use of accessories and will explain the difference between the F stop and the new T stop system.

Mr. Unseld is a graduate of the University of Chicago and was formerly American Vice-Consul in Java. He has traveled throughout the world, taking numerous motion pictures of special subjects, and is editor of the Motion Picture Section of the P.S.A. (Photographic Society of America) Journal.

This program should be of interest to all members, especially those with photography as a hobby.

May 29, No Meeting Scheduled

Because of the Memorial Day weekend, there will be no meeting on Monday, May 29.

June 5, Annual June Dinner

WSE's most important event of the year, the Annual June Dinner, will be held at the Furniture Club of America, Monday, June 5. For full details, see page 9.

President Henry T. Heald of Illinois Institute of Technology, will be the main speaker. You know him as a leading educator, administrator, and civic leader—and always an excellent speaker.

Dr. Gustav Egloff, outgoing president of WSE, will review the year just past, and H. P. Sedwick, incoming president, will announce his new committee appointments.

Many interesting announcements will be made—names of the Cash Award Contest winners, the Charles Ellet Award winner, Service Award recipients, new Honorary members, and new Life members.

It promises to be an evening of top interest—one that you won't want to miss.

IMPROVING *Traffic* MOVEMENT

IN CHICAGO'S CENTRAL BUSINESS DISTRICT

HIGHLIGHTS OF THE STUDY CONDUCTED BY THE MAYOR'S TRAFFIC SURVEY COMMITTEE FOR THE CENTRAL BUSINESS DISTRICT

The rapid increase in the use of the automobile as a major means of transportation has created acute problems in traffic movement. The problems are particularly critical in the Central Business District where traffic delays cost Chicagoans as many as 8,000,000 man hours in a year—or the equivalent of 3,900 persons working regular hours for a year.

When traffic congestion causes too great a loss, a business center will slowly disintegrate and the economic welfare of the entire city can be affected. The prominence of Chicago's downtown area as a center of trade and commerce is unquestioned. 26% of the city's shopping is done here. Almost a million people come in each weekday. The efficient movement of persons and goods must be achieved through prompt corrective action and intelligent planning for the future.

Survey Highlights

The upward trend of vehicle registration in Chicago indicates a continually expanding street traffic problem. From a total registration of 360,985 passenger autos in 1928, the number reached 585,219 in 1941 and has now passed the prewar peak and stands at 634,352.

An ever increasing number of people are driving automobiles to the downtown area. In 1928, 109,374 automobiles entered the Central Business District during a typical weekday. Today 161,232 enter the same area.

Traffic interferences slow passenger automobiles to a low speed of 2.8 mph with an average speed of only 7.5 mph. It is estimated that automobile riders lose 5,500 man hours daily because of traffic delay.

Transit vehicles are unable to attain even the low speeds of the private passenger vehicles. Transit speeds are as low as 2.0 mph with an average of only 5.4 mph. An estimate of time loss for transit passengers indicates a total of 20,000 man hours daily.

The 22,228 commercial vehicles that enter the Central Business District each weekday are also involved in and affected by street traffic congestion. Many of these vehicles lose additional time due to long waits for unloading space in alleys and at loading docks. Approximately 4,000 truck hours are so lost each day.

As many as 948 vehicles were parked at downtown curbs at one time. In one day 26,490 vehicles parked five minutes or more.

Between 8 a.m. and 6 p.m. on a typical day of the survey, 30% of the parkers were at the curb in excess of the time limits established by the City Traffic Code.

Twenty-three percent of all commercial vehicles observed on north-south streets between Michigan Avenue and LaSalle Street had no origin or destination in the central area and were in violation to the City Traffic Code.

At nine major intersections in the area, taxicabs comprised 35% of the total daily traffic volume through these intersections. 28% of the taxicabs observed carried no passengers. Cabs cruising for distances of two blocks or more accounted for more than 9,000 traffic movements during five hours of a survey day.

The Mayor's Traffic Committee is seeking to accomplish these objectives: (1) to measure the degree of street traffic inefficiency, and (2) to develop definite plans for eliminating or minimizing these causes.

Committee Members

Chairman of the committee is Leslie J. Sorenson, Traffic Engineer, City of Chicago.

Other members of the committee include George Barton, consulting engineer, N. U. Traffic Bureau; Randall H. Cooper, executive vice-president, State Street Council; Louis A. Dumond, Manager, Legislative Department, Chicago Association of Commerce and Industry.

James C. Gilruth (WSE), Director, Public Relations, Illinois Automobile Club; Victor G. Hofer (WSE), Traffic Engineer, Chicago Park District; Lloyd M. Johnson (WSE), Commissioner of Streets and Electricity; Kay Lorentzen, Traffic Engineer, Chicago Motor Coach Company; William R. Marston (WSE), Deputy City Traffic Engineer, City of Chicago.

Evan E. Olmstead (WSE), Traffic Engineer, Chicago Transit Authority; Matthew C. Sielski (WSE), Director, Safety and Traffic Engineering Department, Chicago Motor Club; Dick Van Gorp (WSE), Chief Subway Engineer, Department of Subways and Superhighways, City of Chicago.

a good advertising medium

FOR ALERT ADVERTISERS

Midwest Engineer

because . . .

- 5,000 Circulation in America's industrial and residential heart.
- The direct path to specifying, purchasing, and industrial executives—those who say yes.
- Provides coverage in all engineered industries.
- Opens a live market area for machinery, fabricated products, industrial equipment, materials of construction, parts, tools, products and services.
- The mirror of the coordination of engineering and civic interests.
- Advertising rates are extremely low for coverage of this big market.

Western Society of Engineers

84 E. Randolph Street
Chicago 1, Illinois

UNIFICATION

of Railroad Passenger Stations in Chicago

excerpts from a panel discussion presented March 20 before the Western Society of Engineers

CARL G. GARDNER
EXECUTIVE DIRECTOR
CHICAGO PLAN COMMISSION

It is a well-known fact that Chicago has about the most complex railroad pattern of any city in the world and one that was formed more than fifty years ago . . . and there has been little change in that pattern down to the present date.

Other than the Northwestern Station (1911) and the new Union Station (1925), the passenger terminal facilities consist of four ancient outmoded stations which were opened to the public as follows: Dearborn, 1885; Grand Central, 1890; Central, 1893; and LaSalle, 1903. It is to the unification of these four stations that the Chicago Plan Commission is now directing its attention.

There was a general feeling after the passage of the 1919 Lake Front Ordinance that the south side passenger terminal problem had been solved but time proved otherwise . . . the Illinois Central Railroad has made earnest efforts to have other south side railroads join it in the new Lake Front Passenger Station venture but after 31 years of solicitation none of them have expressed any "desire" to become affiliated with it.

Under instructions from Mayor Kennelly, the Chicago Plan Commission began a study of passenger terminals and sites and in May, 1949, recommended to the Mayor and the City Council an area

(*Continued to Page 6*)

W. G. WINHOLTZ
EXECUTIVE DIRECTOR
SOUTH SIDE PLANNING BOARD

In the minds of city planners and civic groups the remaining question at issue is clearly not that of consolidated versus independent terminals, but is rather one directed to the best practical location of such a consolidated terminal.

Three basic proposals are currently in the forefront of consideration. The Chicago Plan Commission proposal—presented to the public on September 8, 1949—would consolidate the Dearborn, La Salle and Grand Central stations into a new terminal at Congress and Wells. Major gain of this proposal would be the elimination of railroad yards between State and Clark Streets north of 16th Street, along with elimination of some interstation passenger changes.

The Illinois Central plan, a development of the Lake Front Ordinance of 1919, would consolidate the Dearborn, Grand Central, and Central stations in the proposed Illinois Central terminals at Roosevelt and Michigan. Its major contribution would be the elimination of railroad yards for Loop expansion from Polk to 16th and State to Clark, as in the Plan Commission's scheme. In addition it would eliminate railroad yards from Harrison to 16th and Wells to the South Branch of the Chicago River.

Both the Chicago Plan Commission and Illinois Central proposals, therefore,

(*Continued to Page 7*)

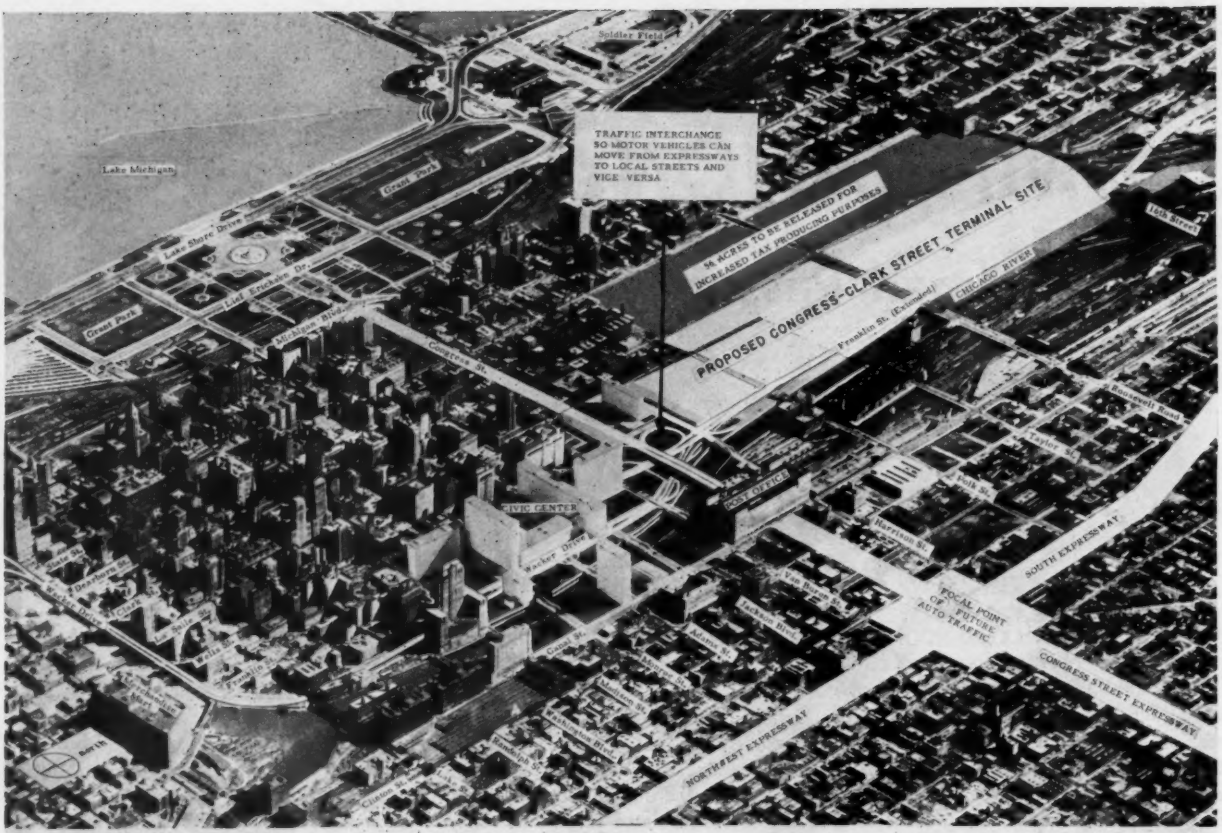
C. H. MOTTIER
VICE-PRESIDENT
ILLINOIS CENTRAL RAILROAD

1. The Illinois Central Lake Front property north of 51st Street is located between the City on the west and Burnham Park on the east. It is crossed by an adequate number of viaducts and consequently does not interfere with the free movement of traffic between the City and the Park. North of 8th Street the tracks are depressed and hidden from view. South of 29th Street the tracks are also depressed and the view of the lake is protected by ordinance. Between these two limits, that is 8th Street on the north, and 29th Street on the south, the tracks are lower than the surface of the Park and are so related that the view of the tracks from the Park is almost entirely hidden by shrubbery. The railroad does not interfere with the use and enjoyment of the Park but provides it with essential freight and passenger service. Railroad operation at this point is practically all by either electric or diesel power. The use and development of this Lake Front terminal site for a passenger terminal will not be detrimental either to the city or to the Park.

2. Because of the unique position of the Illinois Central on the Lake Front, its right of way, including the proposed terminal site, will always be used for railroad purposes.

3. The site permits the construction of a "pull-through" type of station, which is

(*Continued to Page 8*)



PROPOSED CONGRESS-CLARK STREET TERMINAL SITE

CHICAGO PLAN COMMISSION

(*Continued from Page* 5)

lying south of Congress Street, between Clark Street and the Chicago River, as the most practical and feasible location for a consolidated passenger terminal.

The area recommended is owned by the railroads and is adequate for the merging of the three stations mentioned, into a single passenger terminal and station of a size to accommodate thirteen south side trunk lines and one local terminal company. By acquiring an additional 4½ acres of private property at Polk and Clark Streets, through trains of the Illinois Central and tenant railroads at Central Station could also be accommodated.

Factors favoring the selection of the Congress-Clark site were: (1) convenience to the traveling public because of close proximity to the business district and other passenger stations, (2) ready accessibility to public transit and expressways, (3) use and maximum occupancy of property already owned by the railroads, (4) inclusion and occupancy of vacant land made available by river straightening in 1929, (5) continuance of competitive relations with other railroads, (6) relation of site of proposed terminal to other major civic improvements.

The establishment of a consolidated passenger terminal at the site described would release for other non-railroad uses about 56 acres of valuable property between State and Clark Streets which has been owned and continuously occupied since about 1880 by the Dearborn Station group of railroads.

Other benefits from the consolidation would be the removal of freight houses and facilities south of the Loop, elimination of the traffic bottleneck south of the Loop by providing street capacities in proportion to needs, restoration to more productive uses of adjacent blighted property and property made vacant by blighting influences, and general improvement in the physical appearance of property south of the Loop.

Plans of the terminal, prepared by the Chicago Plan Commission, contemplate a stub-end station with the passenger concourse adjoining the south side of Harrison Street, between La Salle Street and the Chicago River, a lobby under Harrison Street and a main waiting room extending north to the Congress Street Expressway. Above the main waiting room is an office building to accommodate the general offices of some of the railroads.

The efforts of the Chicago Plan Commission thus far have been directed chiefly to site selection and physical planning of the terminal on the theory that without an agreed-upon plan, negotiations between the railroads and the City could not proceed. Therefore, detailed cost estimates have not yet been made but approximate figures indicate the total cost of the consolidated terminal will approximate $200,000,000, of which about 28% is for land already owned by the railroads.

SOUTH SIDE PLANNING BOARD

(*Continued from Page* 5)

are essentially "partial consolidation" proposals, and both would leave the city with four separated passenger terminals. The plan of the South Side Planning Board would consolidate the Illinois Central, Dearborn, La Salle, and Grand Central stations into a new terminal just west of the present Union Station, and near enough to the Northwestern Station to bring about complete terminal unification and interchange of passengers.

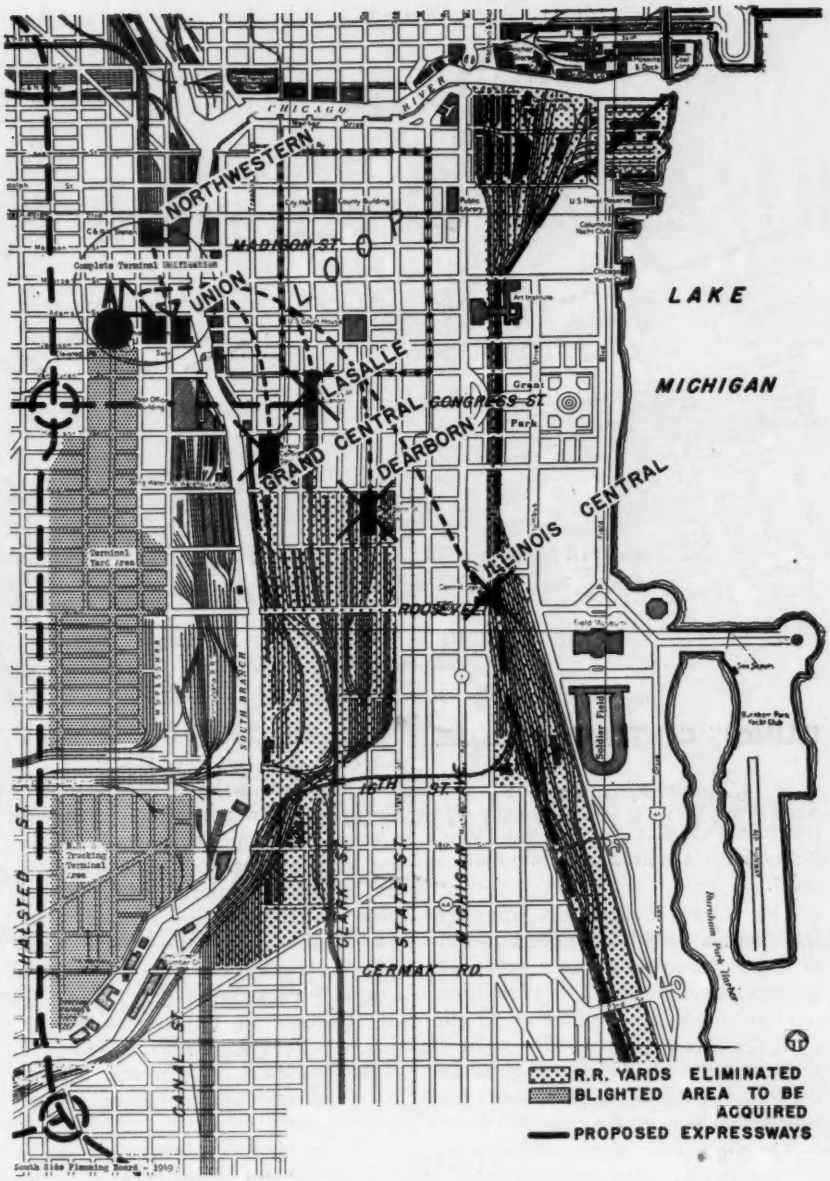
Principal Aims

Principal aims of the South Side Planning Board plan, in addition to complete terminal unification, are the reclamation of the Lake Shore from Grant Park through Burnham Park to the south for park development and recreational use, and the complete elimination of the railroad yard roadblock north of Cermak and west of State to clear the path for Loop expansion southward and alleviation of traffic pressures. In order to complete the liberation of the Lake Front for the use of the public, the presently inadequate south Outer Drive would be relocated in a more efficient location along the Illinois Central suburban right of way.

Under this plan, Rock Island and Illinois Central suburban services would be retained in existing locations, except that Rock Island passengers would be accommodated at Union Station, with a possible subway connection.

Main Benefits

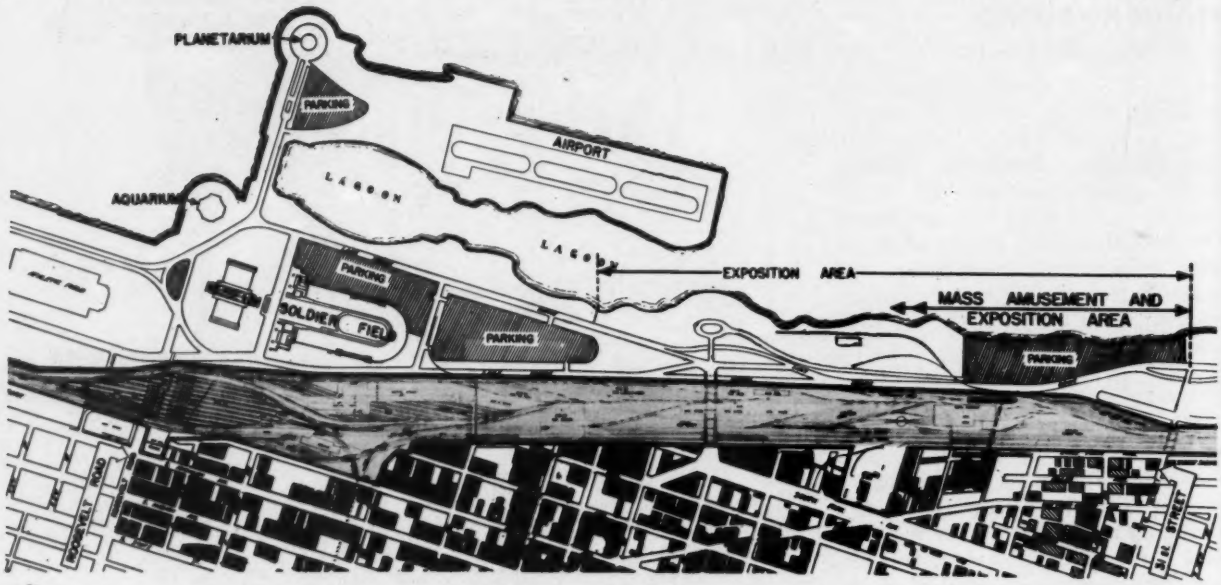
Even though this plan would cost an estimated 100 million dollars more than the Plan Commission proposal, public benefits received, such as the removal of the rail bottleneck to north-south Loop traffic and its integration with the west and north-south express routes, the possible development of the Lake Front recreational area for the south side citizens currently cut off from access to the lake, the possible extension of the Loop commercial district to the south in a development paralleling the swank North Michigan Avenue stretch, potential development of desirable high-density apartments close to the downtown facilities, integration of the rail passenger center with the proposed Civic Center, and resultant appreciation of contiguous properties, would total an aggregate of new assets several times as large as initial expenditures.



Map of Affected Area Illustrating Proposal of South Side Planning Board

Large expenditures would be involved in either the Plan Commission's or the Illinois Central's proposal without solving the basic problem of terminal consolidation. The all-important consideration is that these funds would be expended without hope of securing commensurate benefits. The proposal of the South Side Planning Board, though more costly, involves the purchase of a larger package of benefits, and hence would be more inexpensive and of more lasting value in the long run.

It should be noted that a public terminal authority, similar to the one proposed by former Mayor Kelly and Governor Green in the 1945 General Assembly, would be a necessary requirement to bring any of these three or other consolidation proposals into actuality. The size of the public stakes involved requires the intervention of the public as an active participant in these schemes.



LAKE FRONT PASSENGER TERMINAL SITE AND ENVIRONS

COMMERCIAL & INDUSTRIAL BUILDINGS RESIDENTIAL BUILDINGS

ILLINOIS CENTRAL RAILROAD

(*Continued from Page* 5)

recognized as being superior to a "stub" station from a railroad operation standpoint.

4. The Illinois Central RR approach from the south, with its minimum width of 200 feet and its separate suburban, through passenger and freight facilities, is ideal—probably not equalled in any other metropolitan city. This right of way will be available for certain of the south and southeastern prospective tenants should they wish to use it.

5. The site is adequate to accommodate all necessary terminal facilities. It is of a shape, length and size that can accommodate the necessary passenger equipment and thereby appreciably reduce the cost of operation to the railroads.

6. The terminal site is owned by one company, which should greatly simplify negotiation problems between the City and the railroads, on the one hand, and the owner of the property on the other.

7. It is the only site now designated by city ordinance as a site for a passenger terminal. Much has been done and considerable expense incurred in preparation of the site for such use. The Illinois Central has agreed to admit additional tenants at rentals to be fixed by the Interstate Commerce Commission, if not otherwise negotiated.

8. It will permit the maximum separation between through and suburban services and yet keep them in helpful relation to each other.

9. The location of the consolidated passenger terminal on this site will make possible the opening up of certain south side streets at less cost than would otherwise be possible.

10. It permits the construction of a station with the following advantages:

(a) Minimum interference between inbound and outbound passengers.

(b) Avoidance of interference among private automobiles, taxicabs, buses and Chicago Transit Authority vehicles.

(c) Adequate parking space.

(d) Maximum separation between through and local vehicular traffic.

(e) Minimum average travel distance to and from trains.

11. It is the most favorable site for esthetic development as a gateway to the city.

12. Land values are lower than those of any other practicable site being considered.

13. A consolidated passenger terminal on this site as compared to a comparable terminal on any other practicable site should:

(a) Minimize traffic congestion on downtown streets.

(b) Result in lower total fixed charges to the railroads involved.

(c) Result in lowest total operating costs to the railroads accommodated.

JOSHUA D'ESPOSITO
CONSULTING ENGINEER

Mr. Joshua D'Esposito, an authority on railroad matters and railroad terminals in particular, who is now serving as an advisor to the Honorable Martin H. Kennelly, Mayor of the City of Chicago, in matters pertaining to railroads and railroad terminals, was asked by the Chairman to express his views on the subject of unification of Chicago's vexing problem of consolidation of railroad terminals. His remarks may be summarized as follows:

"A realistic attitude must be taken with objective thinking, divorcing ourselves from the stage of this plan or that, my plan or yours, but rather agreeing upon a plan which has the acceptability of the railroad industry, of other industries and the community of Chicago as a whole. This plan should not be one

(*Continued on Page* 27)

Don't Miss the Highlight of WSE's Year!

ANNUAL JUNE DINNER

JUNE 5, 1950

Henry T. Heald, Speaker

Educator, Administrator, Civic Leader

PRESIDENT, ILLINOIS INSTITUTE OF TECHNOLOGY
FORMER PRESIDENT, WESTERN SOCIETY OF ENGINEERS

Furniture Club of America, 667 No. McClurg Ct.
Fellowship—5:30 p.m. Dinner—7 p.m.

Review of the Year 1949-50

Introduction of New Officers

Announcement of Contest Winners

Presentation of Service, Charles Ellet Awards

Awarding of Honorary Memberships

Introduction of New Life Members

Return This Reservation Blank NOW— While Choice Tables Are Available!

MAIL THIS FORM TO THE WESTERN SOCIETY OF ENGINEERS
84 E. Randolph St., Chicago 1, Ill.

Name: .....

Company: .....

Address: .....

TICKETS $4.00
(including tax and gratuities)

No. of Tickets..... Separate Tables Assigned for 10 Tickets

Make checks payable to The Western Society of Engineers.

WSE Plans Courses To Be Given in Fall

Courses to be sponsored during Fall, 1950, were discussed at a meeting of the Educational Committee of WSE on April 5, 1950.

The fourth Refresher Course for the Professional Engineers Examination will begin September 3, 1950, according to tentative plans. A Refresher Course for the Structural Engineers Examination will also be given.

The four founder societies are cooperating with WSE in the offering of the course for professional engineers, and the Illinois section of the ASCE is cooperating in the structural engineers' course. Northwestern University, Illinois Institute of Technology, and the University of Illinois will participate in the presentation of the courses.

The General Educational Committee of the four founder societies will continue the sponsorship of the philosophy, public speaking, and economics courses offered this spring at the University of Illinois Navy Pier Branch.

Two philosophy courses will be given. The basic philosophy course will have a minimum of 16 students and a maximum of 30. In addition, a second course in philosophy, limited to a maximum of 18 students, will be given. The prerequisite will be the initial course sponsored this year, or its equivalent.

A course in public speaking will be given, and a second course in economics, *Systems of Political Economy*, is planned.

Additional couses may be added after the returns of the *Questionnaire*, appearing on page 14 in *Midwest Engineer* for April, have been studied. Members who have not filled out the *Questionnaire* are urged to do so and send them to WSE Headquarters, 84 E. Randolph Street, immediately.

Courses added as a result of the *Questionnaire*, will be able to start in late September or early October.

Registrations for the courses will be accepted on the first class night, or for those unable to attend the first session, on the second class night.

Appoint Sykes to CHA

Wilfred Sykes, chairman of the executive committee of Inland Steel Company, has been appointed by Mayor Kennelly as a Commissioner of the Chicago Housing Authority.

Sykes' term as one of five members of the Board of Commissioners, will run until 1955. The appointment was approved by the State Housing Board.

He succeeds Charles Kelsteadt, vice-president of Sears Roebuck, who resigned the city post because he is being transferred to Atlanta.

S. N. NIELSEN COMPANY, INC.

ESTABLISHED 1893

General Contractors

3059 AUGUSTA BOULEVARD

CHICAGO 22, ILLINOIS

CRERAR LIBRARY Notes and News

William V. Kahler, past president of WSE and Dr. Eric Oldberg, leading Chicago surgeon, have been elected to the board of directors of The John Crerar Library, according to an announcement made by Britton I. Budd, president of the board. Their appointment fills vacancies left by the resignations of Earl B. Kribben, treasurer of Marshall Field & Company, and Dr. Ludvig Hektoen, president of the Chicago Tumor Institute.

The appointments of Mr. Kahler and Dr. Oldberg are in the tradition of a long line of leading industrial and professional men who have been responsible for the development of The John Crerar Library into the largest public library devoted exclusively to science, technology, and medicine. The library was founded in 1894. Mr. Kahler and Dr. Oldberg are the 50th and 51st men to join the distinguished line of directors which has included from the beginning such men as Marshall Field and Robert T. Lincoln.

William V. Kahler has served as Operating Vice-President of the Illinois Bell Telephone Company since 1946, having first joined the engineering department of the company in 1924. He has also had experience with the Bell Telephone Laboratories and with the American Telephone and Telegraph Company in New York. Mr. Kahler is a trustee of the Illinois Institute of Technology, and a fellow of the American Institute of Electrical Engineers.

Dr. Eric Oldberg is professor and head of the department of neurology and neurological surgery in the University of Illinois College of Medicine, a position he has held since 1936. He first joined the staff of the University in 1931. He previously was instructor in physiology at Northwestern University. Dr. Oldberg is attending neurological surgeon at St. Luke's and the University of Illinois Research and Educational Hospital in Chicago. He is a fellow of the American College of Surgeons, and a member of numerous medical societies. He has written many articles and reviews for medical periodicals, and is at present the associate editor of the *Journal of Neuropathology*.

Americanized Prestressed Concrete

by Blair Birdsall

Asst. Chief Engineer, Bridge Division
John A. Roebling's Sons Co.

PRESENTED BEFORE THE WESTERN SOCIETY OF ENGINEERS, FEBRUARY 26, 1950

It must seem a bit forward for a contractor and manufacturer to presume to present information on design problems to a group of engineers. I know it is fashionable to look with sûspicion on any comments which emanate from a manufacturer who has material to sell, but ask that you accept the assumption that we also are professional men searching for the truth as well as for sales. We are constantly striving to expand the frontiers of knowledge and progress in the field with which we are most familiar—the production and use of wire and wire products.

At the risk of boring those whose interests have led them to delve into the subject, I plan to present some of the elementary fundamentals for the benefit of others who are interested but not yet informed. Therefore, I propose to outline some of the European developments and then describe Americanized Prestressed Concrete which is now emerging from the laboratory.

The talk might well be called Americanized Prestressed Concrete—What?—Why?—and How? In glancing over a new book on the subject by Dr. P. W. Abeles, I have come across a quotation which might well form the text for the evening. It appears in a foreword by Dr. D. B. Steinman and reads as follows: "Whether prestressed concrete in this country will develop along European lines is an open question. The striking difference in cost ratio between materials and labor, the absence of pressing necessity to save steel under conditions of material scarcity, and the influence of specialized techniques already developed in suspension bridge design and related structural arts in this country may affect the direction of development of this comparatively new art in America."

It was with these fundamentals in mind that the Roebling Company set to work in 1944 to adapt the admirable principles of prestressing to American practices. This development is now beginning to bear fruit in structures for public use, some of the details of which will be discussed later.

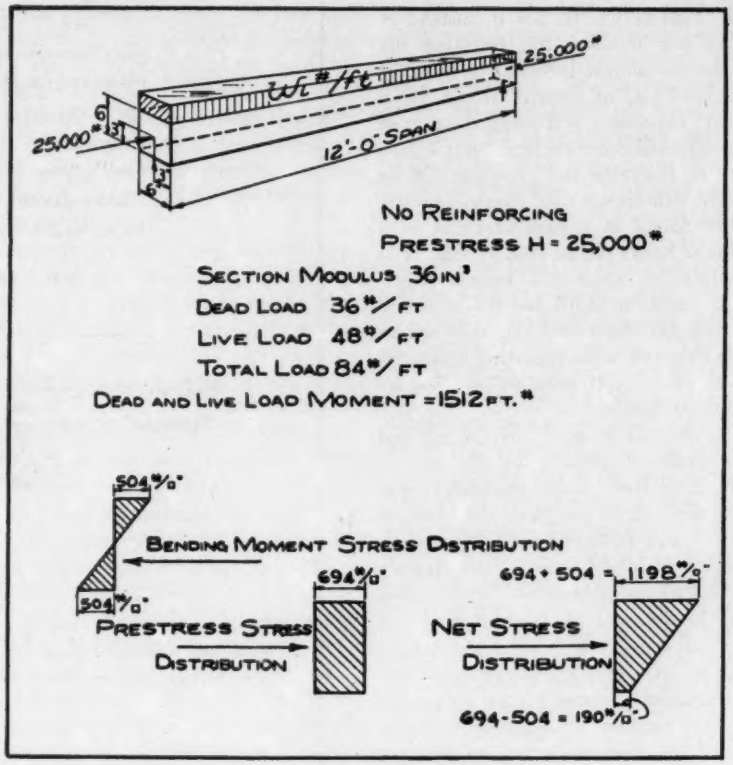


Figure 1

Now for the first phase of our subject—What Is Prestressed Concrete?

Reduced to its essentials, a prestressed concrete structure is made up of concrete members which have been so designed and constructed that bending and direct stresses do not become tensile under design working loads. This applies to both dead and live load stresses. It can be accomplished only by placing the members in compression initially. Let us assume a plain concrete beam without reinforcing, on a simple span of 12 feet and resting on two supports. It has no reinforcing and no prestress of any kind. Its cross-section is a 6" square. The dead weight of the beam is 36 lb. per ft., and it carries a live load of 48 lb. per ft. It has extreme fiber stress at mid-span of 504 p.s.i.—compression at the top and tension at the bottom. Obviously these stresses are not permissible. In Fig. 1 an axial thrust of 25,000 lb. is applied at the center of gravity of each end of the same beam.

This thrust produces a uniform compression over the whole cross-section in the amount of 694 p.s.i. This, together with the bending stress, increases the top fiber stress to a compression of 1,198 p.s.i., and changes the bottom fiber stress to a compression of 190 p.s.i. Thus, the application of the prestress has made it possible for this beam to support its load. However, this same amount of prestress can be made more effective by moving it to a point below

(*Continued on Page* 12)

Americanized Prestressed Concrete

(*Continued from Page* 11)

the center of gravity. In Fig. 2, the point of application is ¾" below the center of gravity. Now the beam can support a live load of 132 lb. per ft. instead of 48 lb. per ft., and the resulting net stresses are almost identical to those of Fig. 1. This, of course, would be a clumsy, expensive and impractical type of prestressed concrete beam, but it may serve to illustrate the principle. More homely examples from every day life can be found in a pack of cards or a group of books placed side by side. Obviously, these "structures" have no shearing or tensile strength, but it is a matter of every day experience that they can be made to act as self-supporting beams by means of a slight pressure applied by fingers or hands.

The desired pressure can be applied in a practical manner by the use of reinforcing steel placed parallel to and either through or alongside the concrete member and anchored to it. This steel, if placed in initial tension, will produce the desired compression in the concrete.

As in the case of a set of books, a prestressed concrete beam need not be made up of a single homogeneous concrete member. Several precast pieces can be placed together. When prestressing is applied the separate pieces act together as a single beam.

The basic idea behind prestressed concrete is not new. It was recorded as early as 1886. The very early attempts met with little success due to the poor quality of concrete. Attempts during the first two decades of the twentieth century failed for another reason. Prestressing was applied with mild steel. Not very long after completion of a beam it was found that all prestressing had disappeared. The reasons for this were recognized early in the 1920's. Shrinkage and plastic flow of the concrete plus, in some cases, creep of the reinforcing steel, caused an effective reduction in length equal to the total elastic stretch produced in the mild steel by its relatively low allowable working stress. It was at this time, therefore, that the necessity of using high strength steel was recognized. This led to the adoption of cold drawn steel wire as the most satisfactory prestressing medium. The material could be stressed six or seven times as high as mild steel with the result that only a small portion of the prestress was lost due to plastic strains.

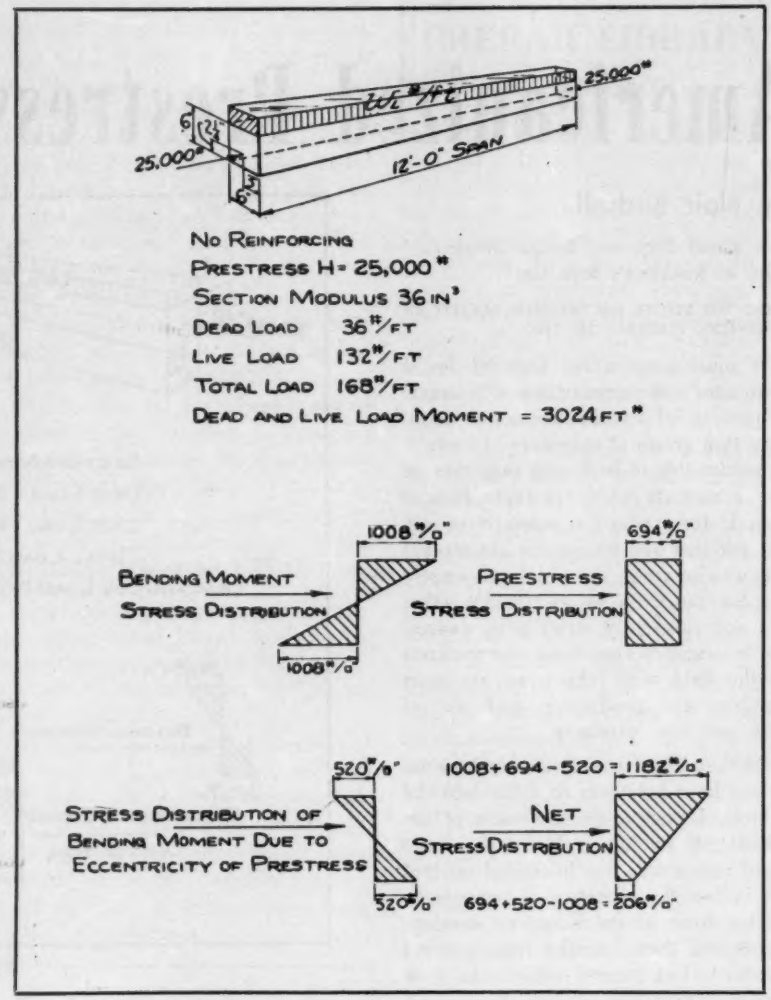


Figure 2

So much for basic principles. Now, why is this material being given serious consideration by American engineers? After all, we do not have the serious steel shortage with which Europe has been faced. There can be only two valid reasons—economy and appearance. The Roebling Company has been so thoroughly convinced that it will stand the test of these two criteria that it has been actively engaged on development work in this field since 1944. Here are some of the reasons for the decision to embark on this program:

Crackless concrete would tremendously improve the appearance and durability of exposed construction such as fence posts, guard rails, beams and lintels, etc.

Jointless and crackless elastic mats as airport and roadway pavements would make a spectacular reduction in maintenance costs. Under existing conditions many state highway departments are becoming desperate enough to wonder if it is not a mistake to use concrete as a road surface under the heavy pounding of present day vehicular traffic. A properly designed prestressed concrete highway should make it possible to eliminate joint problems and the annoyance and cost occasioned by the movements of individual slabs without losing the wearing qualities of concrete. In fact, concrete under compression undoubtedly has improved wearing qualities, and certainly has the resilience and flexibility

necessary to permit it to follow uneven subgrades without cracking.

Estimates indicate that on many structures prestressed concrete can compete successfully in first cost with steel and with ordinary reinforced concrete. Here are some of the reasons for this:

1. It is now possible to manufacture concrete having much higher strength than can be used to advantage in ordinary reinforced concrete. Prestressed concrete thrives on high-strength concrete—the higher the better.
2. Every square inch of concrete is put to work in resisting dead and live loads.
3. Since prestressed concrete lends itself beautifully to the use of precast members, the economic benefits of mass production can be given wider application.
4. The smallest depth to span ratio can be achieved with prestressed concrete, which is beneficial where headroom is a consideration.

In addition to these considerations, there is another which cannot be evaluated so easily in dollars and cents. For the first time concrete becomes a homogeneous engineering material. As a result, design computations are simplified and predictions as to the effects of imposed loadings can be made with greater confidence. For instance, if one is concerned about the human element required in making concrete and placing concrete and reinforcing, he has the satisfaction of seeing all materials subjected to proofload before they enter into service.

Practical Applications

Now, let us review how these principles are applied in practice. First, let us examine European designs.

Many types of reinforcing have been used. They fall into two general categories—bonded and unbonded. Bonded reinforcing is placed under tension before the concrete is poured, using external temporary anchors to take the pull. The concrete is poured in direct contact with the reinforcing. After the concrete has set, the reinforcing members are cut, and the force due to their tension is transferred into the concrete by bond. Unbonded reinforcing is not tensioned until after the concrete has set, and tension is applied by nuts or jacks bearing directly against the concrete member. The reinforcing may be in place during pouring, but surrounded by bond-preventing tubes. In other cases, the reinforcing may be placed after pouring by threading it through recesses left in the concrete.

Bonded reinforcing has the disadvantages that external anchors are required and that the prestressing load is reduced by the elastic shortening of the concrete, as well as by plastic deformations. It has the advantage that only prestressing steel and not bond-preventing devices or end anchorages need be incorporated in the member. In some applications this overcomes the drawbacks.

Generally speaking, the bonded prestress has been indicated in light construction, particularly where duplication of parts permits mass-production methods. The Germans and British have had particular success in casting long lengths of joists with bonded prestressing and cutting them into required lengths with an abrasive wheel after the manner of a bologna slicer.

Unbonded prestressing has been used generally in heavy constructions, but its inherent functional superiority tends to expand its field of use.

In the development of prestressing members, European practice has been built around the ungalvanized cold drawn steel wire as the basic unit, used either singly or in groups wherein all wires are placed parallel to one another. Freyssinet uses a group of wires arranged in a circle for his unbonded reinforcing. They are tensioned by means of jacks at the ends of the beam and anchored between a hollow cone and a conical pyramid of concrete. Magnel arranges wires in the form of a rectangle anchored at the ends by means of wedges. He casts recesses in the beam into which these "cables" are entered after the concrete has set. After prestressing is completed, grout is poured in to fill the recesses and surround the wires. The Walnut Lane Bridge, now being constructed in Philadelphia, is a good example of the Magnel design. The bridge has a main span of 160 ft., and two adjoining spans of 74 ft. each. It is a four lane bridge 44 ft. wide from curb to curb, and is designed for H20-44 loading. It is being built for the City of Philadelphia by Henry W. Horst Company, as general contractor. The prestressed concrete work is being done by the Preload Corporation under a subcontract. The specifications require that a full size test be made of one of the main girders. The prestressing consists of four cables, each containing 64 wires. The diameter of the wire is .276". Two of these cables are straight and parallel to the axis of the member. The other two are curved in the form of a parabola. Based on European experience, test loads were provided having a total weight equal to ten times the design live load, on the assumption that this would cause failure of the beam. Actually, the beam carried this load without failure. To produce the failure it was necessary to rearrange the loading to obtain a bending moment equivalent to 15 times the design live load. There was no wire failure. Failure occurred in the concrete. The wire was furnished by John A. Roebling's Sons Company. The wire for this work was delivered to the job in coils. After being cut to length the wires were assembled into cables on a work table constructed for the purpose. One at a time the wires were threaded through a series of separators which were provided to maintain the shape of the cable. On completion the cable was carefully threaded into the recess left for it in the beam. Although this undoubtedly looks like perfectly normal practice in Europe, it makes an American contractor's heart bleed to see high priced iron workers working with knitting needles instead of drift pins and crescent wrenches.

Americanized System

Throughout its development work in this field, the Roebling Company has recognized that European practices could not satisfactorily be transplanted intact to this country. As a result, an Americanized System of Prestressed Concrete Design is now emerging from the Laboratory.

The basic unit is the Galvanized Bridge Wire. Many of these wires are necessary, of course, to prestress a structure of any size. From the American point of view, the most logical means of grouping these wires is in the form of the time tested Prestretched Galvanized Bridge Strand or Bridge Rope. Thus the fabrication of the prestressing "cables" is put back in the manufacturing plant, where it belongs, according to American practice. Slim cylindrical

(*Continued on Page* 27)

Membership drive nears

Only 84 members needed to

THE joy of victory can be yours . . . As the membership campaign draws to a close, let us pause and look at the record. The group leaders listed below have done an excellent job as evidencd by their 437 new members to date. Some of their group members have done their part by securing their *One* new membr. However, we are still 84 new members short of beating the fine record of 520 new members established in 1947-48.

We have only one more month to do this job. May 31 is the deadline. Time is running out and to succeed we must concentrate our efforts. Write your name in WSE history by helping to establish a 1950 membership record. Call your friends and see those prospects whom you have interviewed previously. Sign them up anl enjoy the thrill of participating in a membership campaign victory.

L. C. GABBARD, *Membership Chairman*

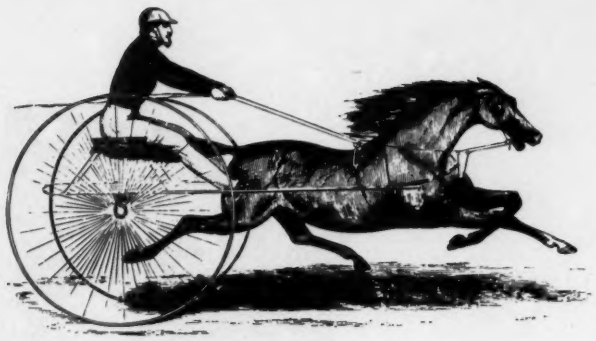
Group Leaders in 1950 Drive

Miller, Herbert R.	28
Sommerschield, H. F.	21
Bryce, William G.	20
Dinsdale, David A.	20
Dore, Arthur J.	17
Elder, Clarence H.	17
Bonham, John D.	16
Elliott, Ernest E.	16
Kucho, Joseph	16
Morgan, George A.	16
Goodell, Floyd K.	15
Barber, Thomas C.	14
McLean, C. J.	14
Mitchell, Chester F.	14
Asmann, Edwin N.	13
Armstrong, E. A.	12
Artman, Mrs. Margaret E.	12
Giller, William C.	12
Kintner, Robert C.	11
Sawyer, Percy	11
Hill, Ole A. Jr.	10
Bigelow, Charles G.	9
Keiser, Charles E.	9
Lundberg, Harold H.	9
Garrison, Charles K.	8
Balkin, Stuart	7
Lawson, R. L.	7
Wagner, Raymond	5
Zmeskal, Otto	4
TOTAL	**437**

every member get a membe

rshome stretch

TO BEAT 1948 RECORD



Members who have secured their New Members

Allen, A. G.
Anderson, Arthur
Anderson, Bolton G.
Anderson, R. E.
Andrews, F. E.
Armstrong, E. A.
Artman, Mrs. M. E.

Baier, P. J. Jr.
Bailey, G. G.
Baker, Albert
Balkin, S. F.
Barlow, J. T.
Barmack, B. J.
Beattie, C. S.
Becker, D. N.
Benoit, Wm.
Bernhard, L. F.
Blanchard, G. L.
Bonham, J. D.
Boysen, A. P.
Bradley, B.
Brewer, A. H.
Burt, George H.
Buxton, B. L.

Carlson, A. C.
Carlson, Wm. C.
Carlson, W. W.
Carnahan, L. B.
Caskey, A. D.
Coxe, H. A.
Crossman, G. I.
Culp, E. R.

Dartsch, F. A. L.
Davies, F. C.
DeLeuw, C. E.
DeWolfe, E. C.
Dinsdale, David A.
Doyle, T. M.

Edwards, F. W.
Egloff, Gustav
Elder, C. H.
Elliott, E. E.
Ellis, H. W.
Epstein, A.
Eshbach, O. W.
Euler, F. C.

Fischer, D. J.
Fitzpatrick, P. J.
Fletcher, E. N.
Flood, Paul
Fox, E. Gordon
Frederick, T. C.

Gabbard, L. C.
Garrison, C. K.
Gates, L. Dean
Gibson, F. D.
Gleick, J. T.
Gnaedinger, J.
Goodell, F. K.
Gordon, B. A.
Gordon, J. J.
Gould, G. Fred'k
Graham, I. E.
Gray, Walter
Griesel, Margaret
Gutgsell, L. M.
Guthrie, R. M.

Hagedorn, H. P.
Hall, George S.
Halperin, Herman
Halvorsen, H. L.
Halvorsen, Ralph
Hanson, C. D.
Hanson, R. M.
Harrington, J. Earl
Haynes, C. J.
Hecht, J. L.
Hendrickson, E. R.
Herr, C. C.
Holt, N. C.
Horneman, Miss B.
Howson, A. W.
Huff, Julius
Humiston, J. F.

Imhoff, E. A.

Jackson, A. L.
Jelinek, O. K.
Jessup, R. D.*
Johnson, Elmer A.

Kahler, W. V.
Kawiecki, C. J.
Keith, A. W.
Kelly, R. R.
Kerr, A.
Kintner, R. C.
Klammer, K. K.
Kocsis, P. Jr.
Kraft, John E.
Kreller, R. A.
Kucho, Joseph
Kuehl, H. A.*

Lagerstrom, Harry
Langdon, L. E.
Larson, M. N.
Lauritsen, C. N.
Lawson, R. L.
LeBaron, T.
LeClair, Titus G.
Lockwood, L. E.
Long, G. F.
Lundberg, H. H.
Lundstrum, J. E.
Lungren, E. E.
Lusher, M. H.

McCallum, V. E.
McClurg, V. O.
McKee, K. E.
McLean, C. J.
McMinds, P. J.
Maihock, D. J.*
Mamett, F.
Maney, F.
Marsh, Edward J.
Marston, W. R.
Mason, W. C.
Mee, C. L.
Melnick, T.
Merrill, Mrs. D.
Michaels, E. E.
Miller, Herbert R.
Mitchell, C. F.
Mittelmann, Eugene
Morgan, G. A.*
Murphy, Miss M. L.
Neighbour, D. J.
Nielsen, E. R.
Norman, C. M.

O'Connor, R. R.
Ooms, J. W.
Orloff, Melvin

Parker, R. I.
Penn, J. C.
Perkins, Miss R.
Perkowski, N.
Peterson, Jas. Edw.
Peterson, Ralph S.
Pillsbury, C. S.

Ramusack, J.
Randall, Edwin A.
Reske, E. F.
Rettaliata, J.
Ritchie, James F.
Rivenes, A.
Rogers, D. E.
Rogers, Edgar
Ruzich, J. L.

St. Germain, A.
Salzman, A. L.
Sargent, Ralph
Saunders, N. H.
Sawyer, Percy
Scaar, Harry
Schick, N.
Schirmer, R. W.
Schlesinger, L.
Schmitz, C. E.
Schoonover, H.
Schutte, L. H.
Schweitzer, W. E.
Scopelite, J.
Sedwick, H. P.
Seymour, C. W.
Serat, G. W.
Showtis, B. M.
Sikes, A. W.
Simpson, G. N.
Skog, Ludwig
Smedley, G. P.
Smith, D. L.
Smith, F. C.
Smith, O. G.
Smith, Osborne B.
Soderholm, A. C.*
Sommerschield, H. F.
Sonderegger, H. H.
Spencer, A. L.
Stanton, K. J.
Stoler, G. S.
Strazz, A. J.
Stump, R. D.
Svelnis, F. V. Jr.
Sykes, Wilfred

Taylor, O. H.
Thomas, Frank P.
Todman, H. G.
Thompson, D. O.*
Towle, J. H.
Tornquist, F. L.
Trees, G. S.
Tuttle, L. W.

Vanderkolk, W. W.
Vanderpool, A. M.
Vivoda, J. V.

Wade, J. William
Walker, C. W.
Walsh, D. A.
Weeks, L. E.
Whitehead, E.
Whiting, F.
Wier, R. J.
Wilkins, D. C.
Williams, Kenneth
Williams, G. M.
Willet, G. R.
Wilson, J. R.
Wisner, G. F. Jr.
Witt, J. C.
Wolfe, Thomas
Woloshin, Boris

Young, H. E.*

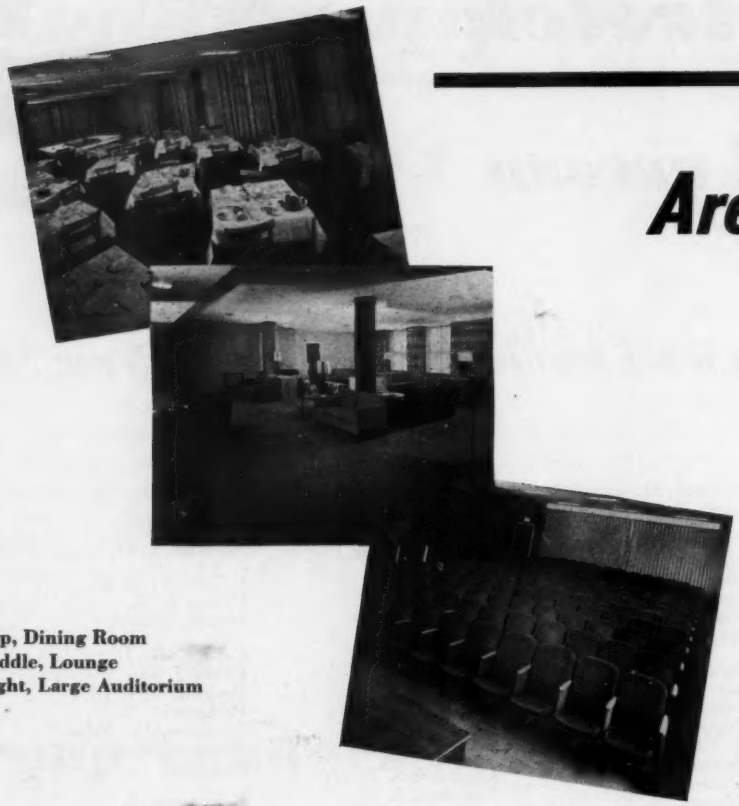
Zachary, J. L.
Zermuehlen, H.

*Since last period

---

per — BY JUNE 1st

Are you planning
New
WSE Spa



Top, Dining Room
Middle, Lounge
Right, Large Auditorium

Attractive meeting rooms in the new Headquarters of Western Society of Engineers may be obtained by professional, technical, and school organizations for meetings. Business organizations and advertising firms may also utilize the facilities for sales or display conferences. The large meeting room has a seating capacity of 200 persons. Comfortable theatre-type chairs, public address system, blackboard and motion picture equipment are some of the conveniences offered.

A smaller meeting room accommodating 100 persons is also located adjacent to the large room. The two rooms may be used together to afford a maximum seating capacity of 300 persons.

The comfortable lounge, as well as the dining room accommodating 150, are open from 11 A.M. to 10 P.M.

84 East Randolph Street is convenient to Illinois Central, "L," street car and bus transportation. There are adequate parking lots in the neighborhood.

Book now to be assured of choice time—you can then relax and concentrate on getting good speakers. The combination of convenient location, interesting speakers, and careful planning spells success for your organization. WSE is anxious to cooperate and assist you in your planning.

...ning your meetings for next season?
...Now is the time to do it!

...E H... Space for Meetings, Conferences, Dinners—Day or Evening

For information, contact:
J. Earl Harrington, Executive Secretary, Western Society of Engineers, 84 E. Randolph Street, Chicago 1, Illinois. Phone: RA ndolph 6-1736.

E. J. Biggs
Construction Corp.
GENERAL CONTRACTOR

8536 S. Peoria St.
Chicago, Ill.
TRiangle 4-5662

E. J. Biggs, Lic. Engr.
Established 1920

FULTON ASPHALT CO.
"Since 1870"
ASPHALT MASTIC FLOORS
ACID PROOF MASTIC FLOORS
INDUSTRIAL COMPOSITION FLOORS
HASTINGS COMPRESSED ASPHALT
BLOCK FLOORS
165 W. Wacker Dr., Chicago 1
RAndolph 6—1760

THE
MONADNOCK
53 West Jackson Blvd.

LONG RECOGNIZED AS
Headquarters for Office Space
FOR
Engineers
Architects
Patent Attorneys
Manufacturers'
Representatives

ALDIS
& COMPANY
Management

The Whole Loop at its Doorstep

WSE To Streamline Billing System

WSE will institute a new system for billing of membership dues for the 1950-51 fiscal year for the purpose of coordinating and simplifying records so that we can give you better service.

In May you will receive your dues-payable statement on a new form, which we ask all members to fill out completely and return promptly with your remittance.

Please check your name and address as it appears on your statement. It's our addressograph record of your status and will be a means of providing you with better service for the little time you will need to spend in cooperating with the office in this matter. All information supplied is held in strict confidence and is merely for the purpose of maintaining our records.

You can assist your Society by indicating the committees on which you will serve if appointed.

Please list your position accurately and in sufficient detail to permit a numerical analysis of WSE membership. Individual names will not be used. Our advertisers in the *Midwest Engineer* want to know the coverage your magazine has by type of position and industry. For example, if you are chief engineer, write chief engineer; if you are assistant engineer, write assistant engineer; if you are one of several engineers, write engineer.

Engineers Are Good Bets In Marriage

Girls looking for a husband have been advised to investigate the possibilities of the engineering profession.

Dr. James Bender, director of the National Institute for Human Relations, told a Carnegie Tech convocation that "engineers have the best hearts for marriage." He warned, however, that most of them are a bit shy and might need some prodding.

He cited six factors which make them the ideal prospect:

1. They apply logic to morals, economics, science and job loyalty.

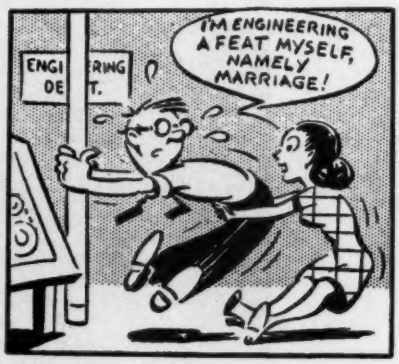
2. They're shy, one-woman men who don't get involved with their secretaries.

3. They're homebodies who like to putter around the house.

4. They're "tender lovers" and good parents who like large families.

5. They're the least neurotic of all vocational groups and rarely quarrel.

6. They're religious and good church attenders.



CHICAGO STEEL FOUNDRY COMPANY
3720 SO. KEDZIE AVE.
CHICAGO 32, ILL.

PYRASTEEL
Heat and corrosion resistant alloy castings

EVANSTEEL
Shock and abrasion resistant alloy castings

Let our engineers assist in the design of your steel castings to assure you of a product that will give dependable service and performance at low cost.

We maintain a well equipped and staffed metallurgical department and all castings are subject to rigid inspection prior to shipment.

WSE To See Navy Exhibit At Science Museum May 15

Members of the Western Society of Engineers will be guests of the U. S. Naval Ordnance Plant of Forest Park (Ill.) at the new naval firepower exhibit in the Museum of Science and Industry, Chicago, on Monday evening, May 15.

This tour is in keeping with the significance of the month of May, 1950—when America will salute its military power through observance of the first National Defense Week and climax it with the first Armed Forces Day on May 20.

WSE members, familiar with the wartime and peacetime industrial accomplishments of the Bureau of Ordnance's torpedo manufacturing plant in Forest Park, will see at the museum a spectacular display of naval ordnance which was designed and built under the direction of Captain Gerald D. Linke, USN, Ret., former commanding officer of that plant.

Capt. Biederman and his staff will provide WSE with a tour of the exhibit and follow it with an explanation of the startling methods which the Bureau of Ordnance utilizes in operation of its plant in Forest Park. The exhibit, which was presented to the public in October 1949, the seventh anniversary of the commissioning of the world's largest torpedo manufacturing plant in Forest Park, is a permanent educational display, and portrays the bridge of an amphibious command ship surrounded by defense screens of destroyers, battleships, and carriers.

Ordnance development and production has been realistically portrayed in the naval firepower exhibit and, according to Capt. Biederman, will give to the millions of visitors to the museum a deeper realization of the vital role naval firepower played in World War II. The display covers 4,000 square feet of display and museum officials estimated that 1½ million people of all ages will see the exhibit each year. Realistic in all respects, the exhibit runs the gamut of interest, from the battleship gray of the bulkheads and the 4,000 or more tiny simulated rivets, to the actually moving battleships and carriers, all in model form and riding the waves in actual formation around the command ship.

The engineering genius behind the Bureau of Ordnance's unusual exhibit at the museum is demonstrated daily at the Navy's plant in Forest Park, deemed to be the most modern and efficient establishment of its kind in the world. Completed in the Fall of 1942 and operated by a subsidiary of the American Can Co., the plant produced over 7,000 torpedoes during the late war. Now it is the Navy Bureau of Ordnance's chief center for production engineering of new types of torpedoes and torpedo equipment. This work is expedited through application of improved manufacturing techniques that will make possible a quick set-up of output in a war emergency.

In its peacetime program, the midwestern plant has submitted to it drawings by the Bureau's research specialists. Mass manufacturing precision techniques are then developed at Forest Park through the activity's fabrication of pilot models for test equipment as well as under water ordnance.

Navy officials reflectively point out that in the days before World War II, torpedoes were turned out by hand and the complicated "small warships" were manufactured at a slow rate. Came the war and the tin fish rolled off the assembly lines at Forest Park like popular priced automobiles do nowadays. A completed torpedo has 5,000 precision parts tooled with the precision of a fine watch and is so accurately constructed that it can be thrown off balance by a scratch on the surface of some parts or a drop of oil in the wrong place.

In its peacetime program the plant employs about 1,300 compared with wartime peak employment of 6,500, and turns out $5-million worth of torpedoes and torpedo parts a year. But the Navy estimates that under full wartime conditions capacity could be stepped up to 7,000 torpedoes a year with the tools and machinery installed in the plant and the streamlined manufacturing methods developed since the war.

Bureau of Ordnance officials have termed the Forest Park station's project as a "pilot" operation. Acknowledging that torpedoes take a lot of manufacturing skill, know-how and expense, and that they are the most difficult of all Naval weapons to make, maintain, adjust and assemble, they are endeavoring to wrap the whole production know-how into a single package. Including manufacturing and inspection techniques, tooling and all other information pertinent to special manufacture, the packaged operation will enable economies and simplify private industry's task of supplying the Navy with torpedoes and parts in wartime.

To keep costs as low as possible, all parts that can be produced more economically outside the Forest Park plant are sub-contracted for. Strict cost accounting and budgeting systems give an exact up-to-date check at all times on parts and component costs, to direct the sub-contracting project.

Also, to simplify change-over by industry to war production, most of the machine tools in the installation are standard machines used in many metal fabricating manufacturing plants. Over 2,000 machines in the plant are laid out for smooth flow of materials and line assembly when capacity torpedo production is needed.

The factory produces both turbine-driven or steam-type and electric motor-driven torpedoes for launching by aircraft, submarines and destroyers. Both types consist of a welded steel tube from 10 to 24 feet long. The steam type consists of (1) the warhead, containing a charge of explosive and a detonating mechanism; (2) the air flask, a welded compartment of air under 2800 lb. pressure, together with compartments holding fuel and water; (3) the afterbody, where are located the turbines which drive the propellor shaft and the gyroscope which guides the torpedo on its course by controlling vertical and horizontal rudders.

Current research is directed toward such problems as increasing range and accuracy of the torpedo, discovering better devices for directing the missile after it has left the ship, improved detonating mechanisms, and the causes of failures in torpedoes under operating conditions on the testing range.

James D. Cunningham

Recipient of CTSC Merit Award Lauded by Associates

Lives of successful businessmen offer numberless examples of what "American system," "American way of life" and "American opportunity" really mean. A striking case in point is found in the career of a still-active industrial leader who tucked his high school diploma in a bureau drawer in 1905, dismissed any ambition he may have had for four years of college and a place on the football squad, and bravely faced the world.

This man would deny that his experience is fair material for any piece of fiction of the Horatio Alger type, yet his record of achievement is a success story that runs quite true to that pattern.

James Dalton Cunningham is one of those leaders in engineering and industry who do not permit the business from which a livelihood is obtained to prevent participation in other worthwhile affairs on a broad scale. While he is identified primarily as a founder and president of Republic Flow Meters Company, an institution that enjoys a proud ranking in its field, his interests cover a far wider range than the manufacture and distribution of material things.

Mr. Cunningham's natural aptitude for leadership was demonstrated when his associates in the field of engineering called him to the presidency of the American Society of Mechanical Engineers for 1950, and to the chairmanship of the executive committee of the Council of that national organization of 25,000 members for the same year. Moreover, the esteem in which leaders in other fields hold him is shown in his election to membership in a long list of directorates, committees, and honorary positions.

One of the projects in which Mr. Cunningham was a driving force, outside the realm of active business, was the merger of Armour Institute of Technology, organized in 1892, and Lewis Institute, founded in 1896, into the present Illinois Institute of Technology, in 1940. His approach to this challenging problem was that it must represent an inclusive program involving man-building as well as technical training. This brand of philosophy caused him to enter into the merger plan in the wholehearted way that was characteristic of the man.

For seven years, from 1933 to 1940, he had been one of Armour Institute's most dependable friends, and a member of its board of directors. He was chairman of that board, has occupied a like position since the merger in 1940, is a member of the policy committee, and has been largely instrumental in making plans for and shaping the future of this increasingly strong technical establishment.

Considering his close association with such ambitious plans, such remarkable growth and such benevolent accomplishments, it is not strange that Mr. Cunningham's methods, traits and character may be best appraised by Dr. Henry T. Heald, president of Illinois Institute of Technology. For many years these men have been in close contact with each other. Therefore, when a man like Dr. Heald says things like these about another man you must know that the subject of the tributes is of no ordinary stripe:

"Interested in people and ideas. Extremely human. Nothing is too much for him to do for a friend or for one in need of help. Always a hard worker on fund-raising drives for worthy causes. Always has time to extend a hand to the person or organization deserving assistance. Probably gives more time to outside undertakings than to his own affairs. Always cheerful, anxious to help, and makes you feel good in the process of doing it."

"I've watched him here in the school many times," said the president, "and I can say that Mr. Cunningham takes as deep an interest in the personal welfare and progress of any boy in the shop as he does in the planning and growth of the institute itself. In the welfare of each lad lies the success of our enterprise as a whole. You can see that the Cunningham philosophy is very personal. How he finds time to do so many fine things for so many people I cannot understand."

"Mr. Cunningham staunchly believes that Illinois Institute has two dynamic obligations to the public," said another associate, "and here we find one of the keys to his thinking concerning his own company and industry in general. He holds that technology must deepen and broaden its educational process to provide socially conscious graduates who will be assets to their communities as well as to their professions. He believes that technology must also foster the fundamental research that is the bedrock of all industry, while training the scientists and engineers who will enter industry and translate research into machines that will save time and money, and then into production that will raise the standard of living."

Mr. Cunningham's industrial leadership includes not only the positions already named, but the presidency of the Illinois Manufacturers' Association and membership in the Western Society of Engineers.

The list of his connections and achievements is impressive, serving to measure the capacities of the man. James D. Cunningham is a good citizen. That might be the way in which he would care most to be remembered if ever he seeks retirement from today's ceaseless round of responsibilities.

Industrial
Commercial

Institutional
Alterations—Additions

Robert G. Regan Co.
General Contractors
Chicago — Joliet, Illinois

Chicago Phone
LA 1-7884

Joliet Phone
5221

WSE
first annual golf tournament

NORDIC HILLS COUNTRY CLUB
ITASCA, ILLINOIS

Saturday, August 12, 1950

ALL DAY OUTING
TEE-OFF TIME — 9 A.M.
GOLF REGISTRATION LIMITED TO 200
PRIZE AWARDS AT DINNER — 6 P.M.

DONATION OF PRIZES BY MEMBERS WILL BE APPRECIATED AND PUBLICLY ACKNOWLEDGED

TEAR OFF— Reserve Your Place NOW

WSE FIRST ANNUAL GOLF TOURNAMENT

NAME: _____

ADDRESS: _____

TELEPHONE: _____

NO. OF RESERVATIONS:

GOLF AND DINNER	$6.00 ☐
GOLF ONLY	3.25 ☐
DINNER ONLY	3.00 ☐

Starting time reservation _____ a.m.
(Subject to committee approval)

AMOUNT ENCLOSED: _____

(Make checks payable to The Western Society of Engineers)

MAIL TO WSE HEADQUARTERS, 84 E. RANDOLPH ST., CHICAGO.

News of WSE Members . . .

The first annual Golf Day should be a complete success if Ray Clark of Link-Belt Company, who is chairman, has his way.

All of his committee members are experienced in this business of golf and tournaments.

Prizes will be handled by Thomas I. Ek, DeLeuw Cather & Company; C. F. Herschbach, Commonwealth Edison Company; and C. A. Walls, Portland Cement Company.

Tickets and scheduling will be in the hands of John M. Hadsall, Link-Belt Company; and social events of the day will be panned by Stanley Pollemz, Illinois Bell Telephone Company.

Rules and tally will be arranged by Allen St. Germain, Illinois Bell Telephone Company; and George Trees, Jr., Chicago Bridge and Iron Company.

* * *

Krol and Hastrup, Engineers, Inc., have moved their office to larger quarters at 209 West Jackson Boulevard. Harold K. Hastrup, one of the partners, is a WSE member.

* * *

Einar T. Blix, vice-president of Mississippi Valley Structural Steel Company, and Donald N. Becker, A. J. Boynton and Company, have recently been the subjects of biographical sketches in the daily column, "Who's Who in Construction," which appears in *Construction News*.

* * *

Dr. H. A. Leedy, Director of Armour Research Foundation of I.I.T., spoke in South Bend, Indiana, April 5, before the Engineers Club of the St. Joseph Valley. His subject was "New Frontiers Through Research."

* * *

Dr. Gustav Egloff, WSE president, will attend the 27th annual meeting of the American Institute of Chemists, New York City, May 11 and 12, at which he will deliver an address on "Petrochemicals—1950 and 2000."

On May 29 he will address the La-Grange Chemists' Club on the subject, "The Petroleum Industry in the Modern World."

* * *

Paul Rogers (WSE), is the author of a paper "Design of Hexagonal Bins," which appears in the March, 1950, issue of the Journal of the American Concrete Institute.

WADEFORD ELECTRIC COMPANY

Electrical Contractors and Engineers

●

Wadeford Electric Company

ESTABLISHED 1887

HAROLD H. LUNDBERG, PRESIDENT

205 W. Wacker Drive • Chicago 6, Illinois

Charles Ellet Award Papers Being Judged

The Charles Ellet Award papers were presented at a competitive meeting April 4 by two members of the Junior Division, and are now being reviewed.

Richard D. Harza, Harza Engineering Company, spoke on the subject, "Water Working for Man."

Donald R. Klusman, Illinois Bell Telephone Company, spoke on "Mechanical Accounting for Metropolitan Telephone Calls."

The judges will meet during May to decide the winner, and will announce their decision at the June Dinner, when the prize will be awarded. The Charles Ellet Award cup will be engraved with the recipient's name and almo mater. This is displayed in WSE Headquarters. In addition, the winner receives $25.00 and an engraved Certificate of Award. The judges are: Verne O. McClurg, J. Earl Harrington, Clifford Hubbell, Ray Erickson, Theodore Van Zelst, and John Gnaedinger.

oooooooooooooooooooooooooooo

WSE Women's Council News

oooooooooooooooooooooooooooo

The Professional Women's Council will sponsor the May 15 meeting of the Western Society of Engineers—a visit to the Naval Firepower exhibit in the Museum of Science and Industry.

Capt. K. J. Biederman, USN, commanding officer, U. S. Naval Ordnance Plant, Forest Park, Ill., (whose article appears on page 19 in this issue), and three members of his staff, will be guest speakers. This meeting of the WSE will help to observe the first National Defense Week, starting May 15.

There will be a dinner, starting at 6:30 p.m. for members and guests in the museum dining room. Please send your reservations to WSE headquarters by May 11. Dinner will be $1.75. Miss Mary Murphy, chairman of the Professional Women's Council, Miss Georgiana Peeney, program chairman, and Mrs. Margaret Jones are cooperating with the Navy in arrangements for this meeting.

Major Lenox Lohr, president of the museum and civilian coordinator for Chicago's observance of the first Armed Forces Day, will be an honored guest.

Announce WSE Officers for 1950-51

Officers of Western Society of Engineers for the year 1950-51 have been announced by the Board of Direction, following the annual election.

A report of the judges of election to the Board on April 27, 1950, shows that the regular ticket nominated under the constitution, was elected unanimously.

H. P. Sedwick was elected president for the coming year. Donald N. Becker was elected first vice-president, and Ovid W. Eshbach was elected second vice-president. John L. Sullivan, Jr. will be treasurer.

New trustees, elected to serve for three years, are L. E. Grinter, and A. W. Howson. In addition, the following trustees will continue to serve: Wilfred Sykes and Fred T. Whiting, one year; and Leroy F. Bernhard and Ludwig Skog, two years.

E. Gordon Fox and L. F. Harza will serve as members of the Washington Award Commission for three years.

In the separate balloting on the constitutional amendment changing membership grades, the results show the amendment passed by a ratio of 16 to 1.

H. P. Sedwick

H. P. Sedwick has been associated with Public Service Company of Northern Illinois since 1913. He served in various engineering and operating capacities until 1941, when he became a vice-president of that company.

He joined the Western Society of Engineers in 1923. He served as a member of the executive committee of the Gas, Fuels, and Combustion Engineering Section from 1945 to 1948, and was chairman of the management committee, 1946-47. He was chairman of the development committee for the year 1947-48; co-chairman of this committee for the year 1948-49; a trustee of the Society, 1945-47; second vice-president for the year 1948-49; and first vice-president for 1949-50.

Donald N. Becker

Donald N. Becker has been chief structural engineer with A. J. Boynton and Company since March, 1948, and previously was engineer of bridge design for the City of Chicago for 24 years. He was graduated from Rensselaer Institute in 1908 with the C. E. degree.

Mr. Becker joined WSE as a member in 1920 and has served as a director of the Bridge and Structural Engineering Section for six years, including one year as chairman. He has been chairman of the attendance and admissions committees.

He was a trustee of the society from 1944 to 1946. In November, 1948, he was elected to fill the unexpired term of treasurer, and was reelected treasurer in May, 1949.

Ovid W. Eshbach

Ovid W. Eshbach is a graduate of Lehigh University, B.S. and M.S. in electrical engineering and honorary Dr. Science. He came to Northwestern as dean of the Technological Institute in 1939, after serving as special personnel assistant with American Telephone and Telegraph from 1925-39.

He dealt with the technical employment of young engineering graduates for the laboratories, taught at Brooklyn Polytechnic Institute, and supervised the graduate electrical engineers group from MIT who were working part-time at AT&T as part of their course.

He is a fellow of the American Institute of Electrical Engineers. He was the recipient of the Octave Chanute medal in 1945, and has been active in WSE affairs since he joined in 1941.

John F. Sullivan, Jr.

John F. Sullivan, Jr., was graduated from the University of Wisconsin with a B.S. in mechanical engineering. He started with Commonwealth Edison Company in 1928 as a field engineer, becoming superintendent of the structural and mechanical division in 1936, and superintendent of construction in 1943. He has been assistant to the vice-president since 1946. He was a Junior Member of WSE from 1928-31, and was reinstated as a Member in 1947.

L. E. Grinter

L. E. Grinter is research professor at Illinois Institute of Technology. He holds the degrees of B.S. in C.E., and C.E. degree, University of Kansas; M.S. in C.E., and Ph.D. in engineering, University of Illinois.

After starting his career with Standard Oil Company of Indiana as a designing engineer, he was professor of structural engineering from 1929 to 1937 at Texas A & M College.

He was dean of the graduate division of Armour Institute of Technology from 1937-40, and joined WSE in 1937.

Arthur W. Howson

Arthur W. Howson graduated from the University of Illinois (B.S. in C.E.), and after serving with the Illinois Central Railroad as an instrumentman, became assistant engineer in 1922. He left for Army service as a Colonel in the Engineers in 1942, returning to the firm of Alvord, Burdick and Howson after the war.

He joined WSE in 1925, serving as Transportation Engineering director for 2½ years; program committee vice-chairman, 1947-48; and chairman, 1948-49; and publications chairman, 1949-50.

E. Gordon Fox

E. Gordon Fox, a past-president of WSE, graduated from the University of Wisconsin (B.S. in E.E.). After employment with the General Electric Company, and others, he joined Freyn Engineering Company in 1920 as electrical engineer, advancing to vice-president. He joined WSE in 1921, and served as third vice-president (1938-39), second vice-president (1939-40).

Leroy F. Harza

Leroy F. Harza, consulting engineer whose firm is Harza Engineering Company, graduated from South Dakota State College (B.S. in M.E.), and the University of Wisconsin (B.S. in C.E., and C.E.). He worked with Daniel W. Mead (WSE) from 1906-12, was a consulting engineer in Portland, Oregon, from 1912 to 1916, and has been a consulting engineer in Chicago since 1916.

GENERAL CONTRACTORS

Joseph J. Duffy Co.

4994 Elston Avenue

Chicago 30, Illinois

COMPLETE SERVICES

INDUSTRIAL

COMMERCIAL

INSTITUTIONAL

WATER FILTRATION UNITS

•

HEAVY CONCRETE

SEWAGE DISPOSAL PLANTS

Telephone SPring 7-6700

Established 1922

Announce Engineer Changes at Edison

George M. Armbrust, (WSE), Chief Electrical Engineer of Commonwealth Edison Company, retired on April 30. He came to the company at the age of 17, and his 47 consecutive years with the utility is one of the longest service records in the Edison Company's history.

Titus G. LeClair (WSE) has been appointed Chief Electrical Engineer, succeeding Mr. Armbrust. Mr. LeClair has been with the Edison company since 1923 when he was employed as a cable engineer. He has held various engineering positions in the meantime and has served as assistant chief electrical engineer since February 1, 1948.

He was born in Superior, Wisconsin, and is a graduate of the University of Idaho in 1921. He is a past president of the Western Society of Engineers and of the Illinois Engineering Council.

Currently he is the nominee for president of the American Institute of Electrical Engineers.

As Chief Electrical Engineer of the Edison company, Mr. LeClair will head the department in charge of the design of the electrical plant, including generating stations and transmission and distribution facilities.

William W. Wishard (WSE) has been appointed assistant chief electrical engineer to succeed Mr. LeClair.

He has held various engineering positions with the Edison company and served as Station Design Engineer since 1943. He is active in committee work for the American Institute of Electrical Engineers, the American Standards Association, Western Society of Engineers and the Association of Edison Illuminating Companies.

J. L. McConnell & Associates

ENGINEERS

STRUCTURAL — MECHANICAL

ELECTRICAL

53 W. Jackson Blvd.

Chicago 4, Illinois

WSE Receives 15 Entries in Contest

Fifteen entries have been received by WSE in the competition for the Cash Award to be given for the best papers on engineering subjects.

The papers are now being circulated among the award committee members, who will report their decision to the Board of Direction at its May meeting. The announcement and presentation of the awards to winners will take place at the June Dinner.

Three awards, totaling $500 will be given. First prize will be $250, Second, $150, and Third, $100.

Papers will be judged on originality, editorial merit, value to engineering, and timeliness of subject matter. If papers of sufficient merit have not been submitted, the Awards Committee reserves the right to award less than three prizes, or postpone the competition.

George L. Jackson is chairman of the committee, and Fred T. Whiting is the Board member on the committee. Other members are I. M. Johnson, Harold J. McCreary, and Clifford B. Cox.

"Where Do They Get Polio?" is the topic of a lecture to be given June 2 by Dr. Maryland Burne Byrne. The American Society of Sanitary Engineering (Illinois Chapter) is sponsoring the meeting, at 1340 W. Washington Blvd., for the medical profession, civic leaders and others interested in public health. Admittance is free.

Working under grants from the Society, Dr. Byrne has made case-by-case studies of poliomyelitis epidemics in Florida, Texas and California during the past four years.

ROBERT W. HUNT COMPANY
ENGINEERS

Inspection • Tests
Consultation

•

Engineering Materials

•

Cement • Concrete • Chemical
Physical and Metallurgical
Laboratories

175 W. Jackson Blvd., CHICAGO, *And All Large Cities*

New Section Directors Announced

New directors of WSE's ten sections have been elected at recent meetings. They are as follows:

Bridge and Structural — Elmer A. Johnson, Asst. to Engr. of Bridges, Illinois Central Railroad, 135 E. 11th Place; John deN. Macomb, Consulting Engineer, 105 E. Delaware Pl.

Chemical and Metallurgical—L. F. Dobry, Argonne Laboratories; J. N. Jenkins, Engr. Mgr., Vern E. Alden Co., 120 S. LaSalle St.

Communications — Robert Daggett Wahlstrom, Division Commercial Manager, Lake Division of Western Union Telegraph Company; Clarence H. Elder, Area Plant Engineer, Chicago Area, Illinois Bell Telephone Company.

Electrical—John F. Humiston, Supervisor of Maintenance Engineering, South Works, Carnegie-Illinois Steel Corp., 3426 E. 80th St.; Paul R. Lallier, Electrical Engineer, Illinois Bell Telephone Company, 212 W. Washington St.

Fire Protection — Milton Aronstam, Director, Health and Safety, U. S. Atomic Energy Commission, Chicago Operations Office; W. F. Kuffel, President, Kuffel, Eggert & Company.

Gas, Fuels and Combustion—H. A. Goss, Mech., Engr., Sargent and Lundy, 140 S. Dearborn St.; Paul C. Kreuch, District Manager, Rockwell Manufacturing Co., 122 So. Michigan Ave.

Hydraulic, Sanitary and Municipal—C. R. Andrew (Ret.), 6518 Kenwood Ave.; Thomas M. Niles, Partner, Greeley and Hansen, 220 S. State St.

Mechanical—J. T. Gleick, Supervisor, Sales Department and Assistant to Vice President, Podbielniak, Inc., 341 E. Ohio St.; Joseph Kucho, Engineer, Link-Belt Company, 307 No. Michigan Ave.

Traffic and City Planning—Charles A. Blessing, Director, Planning Division, Chicago Plan Commission, City Hall.

Transportation — John E. Linden, Staff Engineer, DeLeuw, Cather & Co., 150 N. Wacker Drive; Dick Van Gorp, Chief Subway Engineer, Department of Subways and Superhighways, City of Chicago, 20 N. Wacker Drive.

Consulting—Harold A. Love, Partner, Niestadt & Love, 407 S. Dearborn St.; Frank A. Randall, Partner, Frank A. Randall & Sons, 205 W. Wacker Drive.

The U. S. Civil Service Commission has announced an examination for Field Representative (Electric Utility Management) and Rural Electrification Engineer, paying from $4,600 to $5,400 a year. The positions are in the field service throughout the United States. Some Rural Electrification Engineer jobs are also in Washington, D. C.

No written test is required. To qualify, applicants must meet a basic requirement of appropriate education or education and experience, and in addition must have had pertinent experience of a higher level. Age limits, waived for persons entitled to veteran preference, are from 18 to 62.

Persons interested in these positions may obtain information and application forms from most first- and second-class post offices, from Civil Service regional offices, or by writing to the U. S. Civil Service Commission, Washington 25, D. C. Applications should be sent to the Executive Secretary, Board of U. S. Civil Service Examiners for the Department of Agriculture, Agricultural Research Center, Beltsville, Maryland. They will be accepted until further notice.

W. J. COTTON LABORATORIES
3530 W. Fairmont Ave.
Milwaukee 9, Wisconsin
Hilltop 2-3405
Specializing
In Corrosion Investigations

INDUSTRIAL COMMERCIAL INSTITUTIONAL RESIDENTIAL
E. L. ARCHIBALD CO.
EST. 1916
GENERAL CONTRACTORS
Alterations - Additions
79 W. MONROE ST. CHICAGO 3, ILL.
FRanklin 2-0274
24 Hour Telephone Service

Ventilating
and
Air Conditioning
• • •
Asbestos
Pipe and Boiler
Insulation
• • •
JAMAR-OLMEN CO.
320 N. Harding Ave.
Chicago 24, Ill.
Sacramento 2-3070

E. R. GRITSCHKE
and
ASSOCIATES
Consulting Engineers
Designers of
MECHANICAL and ELECTRICAL SYSTEMS
for BUILDINGS
11 S. LaSalle St., Chicago 3, Ill.

BATTEY & CHILDS
ENGINEERS
231 So. LaSalle St. -:- Chicago
BATTEY & KIPP INC. 1922-1937
PAUL L. BATTEY
LEONARD C. CHILDS
Industrial Plants—Railroad Shops & Terminals
Power Plants—Design & Supervision
ANALYSES REPORTS APPRAISALS

U. S. Engineers Seek Water Supply Facts

Representing the five National engineering societies, the Water Policy Panel of the Engineers' Joint Council has undertaken the highly important and timely task of developing a statement on the water resources of the Nation, with particular reference to the use and abuse of water supply sources.

The immediate objective of the Committee is the production of a statement of professional engineering opinion pertaining to policy and practice in conservation, utilization and protection of water resources, with special emphasis on immediate and long range development of public water supply for domestic, industrial, agricultural and recreational uses.

The Water Policy Panel of E.J.C. has been asked by the President's "Temporary Water Resources Commission" to speed the development of its report for consideration by and guidance of this important new Federal agency. In consequence the Task Committees, named jointly by the E.J.C. Water Panel and the Panel's special Coordinating Committee, are working under pressure to develop recommendations on a water resources policy at the National, State and Municipal levels within the 60-day period to meet a June 1 deadline.

The Water Policy Panel's special Coordinating Committee to which the eight Task Committees will report is headed by Dr. Abel Wolman of Johns Hopkins University as Chairman. W. W. Horner of St. Louis, past-president of A.S.C.E., is general chairman of the E. J. C. Water Policy Panel.

The eight Task Committees, appointed jointly by Chairman Horner and Wolman, and their respective Chairmen are:

1. "Domestic and Industrial Water Supply Pollution" (Chairman, L. R. Howson, Cons. Engr., Chicago)
2. "Flood Control and Water Flow Retardation" (Chairman, J. A. Short, Mo. Dept. of Resources and Development, Jefferson City, Mo.)
3. "Navigation and Water Transportation" (Chairman, Col. Cary H. Brown, Eastman Kodak Co., Rochester, N. Y.)
4. "Irrigation" (Chairman, S. T. Harding, Cons. Engr., Berkeley, Calif.)
5. "Hydro-electric Power" (Chairman, Col. F. W. Sheidenheim, Cons. Engr., New York)
6. "Recreation, Fish and Wild Life Aspect of Water Resources" (Chairman, M. P. O'Brien, Univ. of Calif., Berkeley, Calif.)
7. "Basic Water Resources Information" (Chairman, G. R. Williams, Cons. Engr., New York)
8. "Land Drainage" (Chairman, Edmund Friedman, Cons. Engr., Miami, Fla.)

At the organization and planning meeting of Task Committee Chairmen with members of the E.J.C. Water Panel and Coordinating Committee it was the expressed desire that expressions of opinion and constructive suggestions regarding a national water policy be invited from the engineering profession at large, water supply officials (domestic and industrial) and stream control authorities.

Since there is little time to develop the composite Emergency Report for use by the President's Water Resources Commission, constructive suggestions and recommendations to Task Committee Chairman must be sent promptly.

WSE Participates In Power Conference

The annual Midwest Power Conference, held April 5, 6, 7 at the Sherman Hotel in Chicago, was a complete success, according to reports of WSE members who attended.

The conference was sponsored by Illinois Institute of Technology, with the cooperation of nine universities and nine technical societies.

The All-Engineers Dinner, held April 6 in the Grand Ball Room of the Stevens, was attended by more than 1000 conference delegates. Speaker of the evening was Philip D. Reed, chairman of the board, General Electric Company, and president of the International Chamber of Commerce. Toastmaster was Robert E. Wilson, chairman of the board, Standard Oil Company of Indiana.

WSE sponsored the luncheon on April 7 in the College Inn at the Sherman. The guest speaker was J. B. Thomas, president, Texas Electric Service Company, Fort Worth, Texas. Dr. Gustav Egloff, WSE president, was chairman of the luncheon. It is expected that the address of Mr. Thomas will be published in a future issue of *Midwest Engineer.*

Lieutenant General Leslie R. Groves, U.S.A. Ret., former head of the Manhattan Engineer District, addressed alumni of Illinois Institute of Technology May 5 at the annual Alumni Reunion dinner.

General Groves, who directed the development and production of the first atomic bombs and remained in charge of atomic development until the formation of the Atomic Energy Commission in 1947, is now vice president of Remington-Rand, Inc. in charge of scientific research.

FAHRITE Stainless Steel CASTINGS

HEAT AND CORROSION RESISTANT ALLOYS
CARBON AND OTHER ALLOY STEEL CASTINGS

An outstanding engineering and metallurgical staff is ready to help you design dependable castings that fit your needs exactly . . . and economically.

THE OHIO STEEL FOUNDRY COMPANY
SPRINGFIELD, OHIO Plants at Springfield and Lima, Ohio
Chicago Office HArrison 7-7866 Room 909—122 S. Michigan Blvd.

4606-28 West 12th Place
Chicago 50, Ill.

VENTILATION THE ZACK CO. AIR CONDITIONING

BI shop 2-1533-4-5 Town Hall 3-0905

Americanized Prestressed Concrete

(*Continued from page* 13)

end terminals have been developed for these cables. They are attached in the factory by means of a hydraulic press. These terminals are threaded for nuts which rest against bearing plates in the completed concrete member. The cables remain free of bond throughout the life of the structure. This external anchoring of unbonded reinforcing makes it possible to take all the guesswork out of prestressed concrete design. Assumptions regarding shrinkage or plastic flow of concrete can be checked at any time by measuring the tension in the prestressing member. At the same time the tension can be increased if necessary.

In the studies we have made, the advantages of parabolic prestressing were self-evident. The vertical shear is taken by the cables. Furthermore, the eccentricity of the prestressing load is greatest at mid span where it is most beneficial and is zero or very small at the end of the span where its presence is detrimental.

To make prestressing most effective, most of the dead weight to be supported by the member should be in place at the time the member is prestressed. This, together with the wasteful nature of concrete placed near the center of gravity leads toward the selection of a shape such as the hollow box as the most efficient cross-section. Thus, for a bridge floor, for instance, the top of the prestressed member also serves as the roadway surface.

In addition to its structural efficiency, the box makes it possible to precast the span in many sections, assemble them, prestress the assembly, and have a finished unit containing prestressing members in a dead air space for long time protection.

These principles have been service tested in a 3" thick jointless prestressed section of the floor of the Roebling Warehouse in Chicago. The prestressed area is approximately 100 ft. x 150 ft. in area. Prestressing members consisted of two layers of galvanized bridge wires—4¼" on centers in one direction and one layer of 9/16" dia. galvanized bridge strand 14" on centers in the other direction. Bond preventing paper tubes surrounded each member.

The concrete was stressed to 600 lb. per sq. inch in both directions. In striking contrast to the surrounding floor areas, this slab (better described as an elastic mat) remains absolutely crackless after carrying heavy concentrated loads since October 1946.

In 1948 this general type of design was placed in service for public use on a suspension foot-bridge across the Delaware River between Pennsylvania and New Jersey at Lumberville, Pennsylvania. Precast floor sections spanned the full width of the bridge, approximately 9 ft. Each section was 4 ft. wide in the other direction. Approximately 200 of these slabs were cast at the Roebling Plant in master forms, prestressed in the long direction by ½" dia. high strength rods, and shipped to the job. As they were strung out along the bridge, the 9/16" dia. longitudinal prestressing strands were threaded through them and finally prestressed against them using a jacking device similar to that shown for the warehouse floor. The result was a floor over a clear span of about 8 ft. having a weight of 40 lb. per sq. ft. and designed to carry a live load of 85 lb. per sq. ft. A test slab was subjected to a concentrated load applied through a 6" dia. steel cylinder at the top center of one of the cells of the honey comb. The top slab was 1½" thick and contained nominal reinforcing consisting of 2" sq. mesh of No. 10 wire. The clear span of the cell is 9" x 10½". A load of 23,500 lb. was required to punch through the top.

As a result of these developments a new system of prestressing is available which is practical by American standards of construction.

In summary I would like to leave you with these thoughts. The basic principles of prestressed concrete are almost certain to find wide application in this country, but only if we do not blindly follow foreign practices on materials and methods. At least one system of Americanized Prestressed Concrete is now available for general use on all types of structures in addition to the practices which have already been developed by manufacturers of precast products and in the field of cylindrical members such as pipes and tanks. Let us erase the question marks from prestressed concrete design as quickly as possible. Material is available right now which eliminates creep of steel as a consideration.

JOSHUA D'ESPOSITO CONSULTING ENGINEER

(*Continued from Page* 8)

which perpetuates either the long time commitments of the past nor the everlasting dreaming of the distant future. It may be a plan of many compromises but must be a plan which basically does that which Chicago for so long strived and for so long suffered.

In Mr. D'Esposito's opinion no plan can be successful until an instrument of unification to carry it out both physically and financially can be found and set up. In this instrument or agency, confidence of the industry of the City and of the financial community must repose, so that some business basis for this instrument can be laid. Without such an agency or instrument we are but going through the motions without accomplishing the purpose.

— CUSTOM BUILT —

TO YOUR SPECIFICATIONS

Switchboards ..... Benchboards
Panelboards ..... Steel Cabinets
Distribution Panels ..... Motor Control Centers
Junction Boxes ..... Raceways ..... Busducts
Sheet Metal & Light Structural Fabrication

GUS BERTHOLD ELECTRIC CO.
1716 W. HUBBARD ST.
CHICAGO 22, ILL.
CHesapeake 3-5767

May Advertisers

Allied Structural Steel Companies ..... Back Cover
Vern E. Alden Co. 28
Aldis and Company 18
Alvord, Burdick and Howson 28
E. L. Archibald & Co. 25
Bates and Rogers 32
Battey and Childs 25
Berthold Electric Company 27
E. J. Biggs 18
Burgess-Manning Company 29
Chicago Bridge and Iron Company .... Inside Front Cover
Chicago Steel Foundry Co. 18
Clay Products Company 31
W. J. Cotton Laboratories 25
DeLeuw Cather & Co. 32
Joseph J. Duffy Co. 24
Walter H. Flood 28
Freyn Engineering Company 28
Fulton Asphalt Co. 18
Greeley and Hansen 28
Griffenhagen and Associates 30
E. R. Gritschke 25
The Haines Company 28
Robert W. Hunt Company 24
Jamar-Olmen Co. 25
J. L. McConnell & Associates 24
Marquette Electric Switchboard Company 30
Mississippi Valley Structural Steel Companies .. Inside Front Cover
National Survey Service 28
S. N. Nielsen Company 10
Ohio Steel Foundry Co. 26
Robert G. Regan 20
Sargent and Lundy 32
Sauerman Bros., Inc. 28
Wm. E. Schweitzer, Inc. 30
Territorial Information Service ..... Inside Back Cover
Wadeford Electric Company 22
The Zack Company 26

FREYN ENGINEERING COMPANY
Established 1914
CONSULTING ENGINEERS
for
Blast Furnaces—Steel Works—
Industrial Plants
Industrial Power Generation and Use
Technical and Financial Reports
Surveys—Appraisals
Designs and Supervision of Construction
109 North Wabash Avenue
CHICAGO 2

Charles B. Burdick Louis R. Howson
Donald H. Maxwell
Alvord, Burdick & Howson
ENGINEERS FOR
Water Works, Water Purification, Flood Relief, Sewerage, Sewage Disposal, Drainage, Appraisals, Power Generation
20 N. Wacker Drive - Chicago 6
Telephone: CEntral 6—9147

SAUERMAN BROS., Inc.
Engineers and Manufacturers
Slackline Cableway Excavators
Power Drag Scrapers
Scraper Systems for Open Storage of Coal and Bulk Materials
Tautline Conveying Cableways
522 S. Clinton St. CHICAGO

ESTABLISHED 1913
WALTER H. FLOOD & CO.
CHEMICAL ENGINEERS
Inspection and Testing
Of Materials and Structures
Buildings, Roads, Streets, Airports
SUPERVISION OF CONSTRUCTION
CONCRETE CORE CUTTING
6102 S. BLACKSTONE AVE. CHICAGO 37
Branch—1332-4 N. Westnedge Ave.
Kalamazoo 53, Mich.

GREELEY AND HANSEN
ENGINEERS
Samuel A. Greeley Kenneth V. Hill
Paul E. Langdon Samuel M. Clarke
Thomas M. Niles Paul Hansen (1920-1944)
Water Supply, Water Purification
Sewerage, Sewage Treatment
Flood Control, Drainage, Refuse Disposal
220 S. STATE STREET, CHICAGO 4

NATIONAL SURVEY SERVICE, INC.
S. PASQUINELLI, M.W.S.E.
REGISTERED LAND SURVEYOR
ILLINOIS & INDIANA
Precise Construction Surveys
Accurate Land Boundary Surveys
134 N. LaSalle St., Chicago, Ill.
RAndolph 6—7609

THE
HAINES
COMPANY
Ventilation &
Air Conditioning Contractors
Sheet Metal Fabricators
— Welding —
1931 WEST LAKE STREET
CHICAGO 12, ILLINOIS
SEeley 3—2765

VERN E. ALDEN COMPANY
ENGINEERS
120 S. LaSalle Street
Engineering Investigation
Engineering Design

WSE Applications

In accordance with the By-laws of the Western Society of Engineers, the following names of applicants are being submitted to the Admissions committee for examination as to their qualifications for admission to membership into the Society in the various grades, i.e., Student, Junior, Member, Associate, etc. All applicants must meet the highest standards of character and professionalism in order to qualify for admission, and each member of the Society should be alert to his responsibility to assist the Admissions committee in establishing that these standards are met. Any member of the Society, therefore, who has information relative to the qualifications or fitness of any of the applicants listed below, should inform the Secretary's office, 84 E. Randolph St., RA ndolph 6—1736.

411-81 Richard Y. Mine, Architectural Engr., Holabird & Root & Burgee, 180 N. Wabash Ave.

412-81 Harold J. O'Connor, Plant Engr., Illinois Bell Telephone Co., 725 Chicago St., Hammond, Ind.

413-81 Edwin W. Storer, III, 3214 S. Michigan Ave., attending Illinois Institute of Technology.

414-81 Robert L. French, Estimator Engr., Worthington Pump & Machinery Corp., 400 W. Madison St.

415-81 Edward E. Perlick, Sales Engr., Allis-Chalmers Manufacturing Co., 135 S. LaSalle St.

416-81 Asher S. Gruenberg, 3453 W. Grenshaw St.

417-81 Wendell W. Holmquist (Rein.), Plant Engr., Matthiessen & Hegeler Zinc Co., LaSalle St.

418-81 Miss Marie C. Folta, Sec'y., H. R. Bogner, Bingham Pump Co., 407 S. Dearborn St.

419-81 Edward K. Kuhles, Mechanical Engr., Bagby Co., 1827 Benson Ave., Evanston, Ill.

420-81 Russell L. Craig, Electrical Engr., Ralph H. Burke, 20 N. Wacker Dr.

421-81 Raymond M. Lindemer, Staff Assistant, Public Service Company of Northern Illinois, 72 W. Adams St.

422-81 Edwin H. Wendt, Treasurer, O. A. Wendt Co., 1655 W. Fullerton Ave.

423-81 James W. Buell, Senior Engr., Illinois Bell Telephone Co., 1025 Sunnyside Ave.

424-81 Edward K. Alexander, Chief Engr., U. S. Steel Supply Co., 1319 W. Wabansia Ave.

425-81 Lyall J. Wright, Field Engr., Portland Cement Association, 33 W. Grand Ave.

426-81 Edward F. Jolyk, 4439 S. Campbell Ave., attending Illinois Institute of Technology.

427-81 Alvin J. Robertson, 5942 W. Thorndale Ave., attending Illinois Institute of Technology.

428-81 Harrison D. Worthington, Sales Engr., American Steel & Wire Co., 208 S. LaSalle St.

429-81 Joseph J. First, Chemical Engr., Vern E. Alden Co., 120 S. LaSalle St.

430-81 Edith C. Liewehr, Assistant to Executive Vice President, S. N. Nielsen Co., 3059 Augusta Blvd.

431-81 John W. Taylor, 528 Prompton Ave.

432-81 Donald R. Prosser, Owner, D. R. Prosser Co., 850 Thacker St., Des Plaines, Ill.

433-81 Harold W. Kuehl, Engineering Assistant, Kuehl & Heavey, 337 W. Madison St.

434-81 Sydney C. Anderson, III, 3015 Thayer, Evanston, Ill., attending Northwestern University.

435-81 H. I. Romnes, Equipment & Building Engr., Illinois Bell Telephone Co., 212 W. Washington St.

436-81 John F. Croghan, Junior Engr., Commonwealth Edison Co., 2233 S. Throop St.

437-81 Robert B. Hurt, Senior Structural Inspector, Stone & Webster Engineering Corp., 49 Federal St., Boston, Mass.

438-81 Jacob H. Euston, Vice President & Secretary, Business Research Corp., 105 S. LaSalle St.

439-81 Shirley E. Schultz, 3447 N. Oak Park Ave., attending Illinois Institute of Technology.

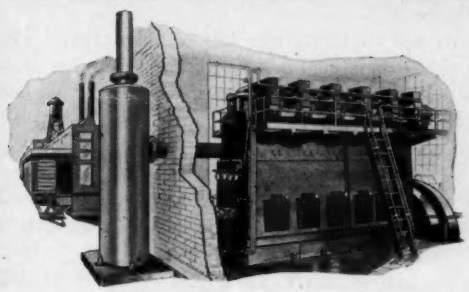
440-81 Thomas R. Byrnes (Trsf.), Assistant Engr., Underwriters' Laboratories, Inc., 207 E. Ohio St.

441-81 Bruno Sandona, 64 E. 101st Pl., attending Illinois Institute of Technology.

442-81 E. B. Engquist (Trsf.), Assistant Engr., Commonwealth Edison Co., 72 W. Adams St.

443-81 James H. Andrews (Trsf.), Architectural Engr., Wm. F. Thornton & Associates, 108 N. Dearborn St.

444-81 Edward Marks, Partner, Raymond F. Houlihan & Associates, Inc., 30 N. Dearborn St.



SNUB THE SLUG and STOP THE NOISE

Noise from engines, compressors, blowers, and vacuum pumps can be prevented by using Burgess-Manning Snubbers. The Snubber prevents noise by smoothing the intake air and dissipating the energy in the exhaust gas slugs, providing quiet operation without affecting performance.

The Burgess-Manning line consists of air intake and exhaust Snubbers and Combination Air Intake Cleaner-Snubbers for use on internal combustion engines, compressors, blowers, and vacuum pumps. For solution of your noise problems, consult the Burgess-Manning Engineers.

BURGESS-MANNING COMPANY

749-W East Park Avenue, Libertyville, Illinois

Reviews of Technical Books

Available at WSE Headquarters

Structural Problems

Elementary Structural Problems in Steel and Timber, Third Edition, by C. R. Young and C. F. Morrison. John Wiley and Sons, Inc., New York, 1949. 329 pp. $4.50.

This is a compilation of a large number of structural design problems, worked out in detail, and including points frequently overlooked in usual design. Part I covers steel structures, and Part II, timber structures. The reader should have a basic knowledge of statics and mechanics of materials.

For steel structures there are problems in tension and compression members, beams, girders and trusses, and details. For timber structures there are problems in tension and compression members, roof framing and trusses, a timber trestle, and details.

The formulae used in the solution of the problems are, in general, given at the beginning of the respective chapters, with definitions of the terms involved. References are made to standard textbooks for the derivation of the formulae.

At the ends of many of the chapters are given a number of exercise problems, the answers to which are found at the end of the book.

Students and engineers who like to have examples before them to check their method of solution of similar problems will find this to be a very interesting and valuable book.

H.F.W., WSE

E. E. Handbook

Electrical Engineer's Handbook (Electric Power Section), by Pender and Del Mar, John Wiley and Sons, New York, 1949. 1716 pp., $8.50.

In its original edition in 1914, this well-known handbook covered all branches of the subject in one volume. With the third edition in 1936, it was found advisable to break up the subject matter into two volumes and the same arrangement has been followed in the fourth edition. These volumes are sub-titled "Electric Power" and "Electric Communication and Electronics."

Sufficient matter is duplicated so as to make each volume complete and independent in itself. 400 pages have been added for the fourth edition of "Electric Power," and seventy-one specialists have contributed to this very complete reference. Subjects such as servo-mechanisms, rural electrification, induction and dielectric heating, rectification, and lighting as well as the more usual subjects are extensively treated. 977 diagrams and illustrations aid in explanations.

This handbook is of particular value to the designing engineer in its complete consideration of theory, but will find its place as well in the operating and construction fields.

The 46 page alphabetical index and fine bibliographies add to the usefulness and convenience of this handbook.

J.A.S., WSE

Bridge Design

The Rigid Frame Bridge, Third Edition, by Arthur G. Hayden and Maurice Barron, John Wiley and Sons, Inc. New York, 1950. 240 pp., $5.

This book treats of the design of rigid-frame short-span reinforced concrete and structural steel bridges, of which the best known examples are probably those in Westchester County, New York. This type of bridge well meets the conditions imposed by the restricted headroom in the grade separation of intersecting roads, and it can be treated architecturally in a pleasing manner.

The theory of design of this type of indeterminate structure is fully, but tersely explained in this volume, and sample calculations are given for both single-span and two-span bridges. The principal new feature of this edition is the simplified method of analysis of skewed bridges, which makes their design almost as easy as the design of unskewed bridges. The influence line method of analysis is used in this edition, as in previous ones, but briefer methods are also explained. Higher mathematics and the calculus are not required in the use of these analyses.

Engineers who design rigid-frame bridges will recognize this book as a valuable addition to their list of references.

H.F.W., WSE

WM. E. SCHWEITZER & CO.
General Contractors
2207 Dodge Avenue
EVANSTON, ILLINOIS
AMbassador 2—3489 GReenleaf 3—4414
★ ★ ★
Contractors for Industrial Construction

GRIFFENHAGEN & ASSOCIATES
Established 1911
CONSULTANTS IN MANAGEMENT
Head Office in Chicago
333 N. Michigan Ave.

Marquette Electric Switchboard Co.
311 N. Desplaines St.
Chicago 6, Ill.
W. F. Schaller (WSE), President

Electrical Engineering

Fundamentals Of Electrical Engineering, by V. P. Hessler and John J. Carey, McGraw-Hill Book Co., New York, 1948. 241 pp., $3.50.

This volume is one of the McGraw-Hill Electrical and Electronic Series. It is prepared for use in beginning courses for electrical engineering students who have had or are studying integral calculus. The two authors are from the electrical engineering faculties of the Universities of Illinois and Michigan.

Considerable space is devoted to a thorough explanation of the various unit systems. The text is written in the MKS unrationalized system and the authors feel that some of the confusion resulting from different systems can be reduced by their thorough treatment.

Problems, both explanatory and as exercises, as well as the practical tables make this book valuable as a textbook.

J.A.S., WSE

Surveying

Review of Route Surveying, Third Edition, by George W. Pickels, and Carroll C. Wiley, John Wiley & Sons, Inc., New York, 1949. 434 pp.

This book is a revision of previous editions in which the authors bring up to date the practices in the design of alignment for railroads and highways and methods of surveying for both.

It includes a chapter on string-lining railroad curves with explanation and reasons behind the operations involved in the two methods presented to give the engineers a clearer idea of the principle.

Enough material is given on railroad turnouts, crossings, switches, etc., to give good basic information for the computations and field layouts for any of these elements which might be encountered in practice.

Chapters on curves, both vertical and horizontal are well written and the authors should be congratulated on continuing their policy of selling the simplicity of the spiral to the engineer. Rather than burden the engineer with tables which often require complex formulae and explanations to use, they stress the use of the mathematical solutions. With formulae which in themselves are not too complicated, various figures are used to show how easy it is to compute and lay out spiralled curves. Engineers will do well if it is in their work to use spirals to become acquainted with the Talbot Spiral presented in this book.

Recognition is taken of the fact that calculating machines are being used universally so logarithmic tables included in previous editions have been omitted and the five place tables of natural functions have been expanded to seven places.

On the whole, the book is well written and can be very useful to both railroad and highway engineers.

E.L.R., WSE

Hydroelectric Handbook

Hydroelectric Handbook, Second Edition, by William P. Creager and Joel D. Justin, John Wiley and Sons, Inc., New York, 1950. 1177 pp. $12.50.

This outstanding book covers its field so broadly that a brief review of it is inadequate. In addition to the authors, nineteen eminent authorities have contributed to the chapters and sections. It presents essential data on the design and operation of hydroelectric power projects, including their mechanical, electrical, and structural features.

The first of the four major divisions of the Handbook covers the investigation and planning of hydroelectric projects, discussing in great detail rainfall, evaporation, river gaging, flood flow and similar natural factors, and describing the various types of hydroelectric plants and economic factors including economic comparison of hydroelectric and steam operated generating stations.

The second and third divisions describe the various types of dams, including spillways, intakes, conduits, canals and tunnels. The final division deals with the mechanical and electrical equipment of a hydro plant and methods of its operation, including electrical design, hydraulic turbines, generators, transformers, and transmission lines.

Many of the sections are so complete with respect to correlated engineering matter as to be of value to one interested in that particular field aside from hydroelectric project design.

E.B., WSE

Father
Time
approves
CLAY
the only sewer pipe that
NEVER WEARS OUT
Vitrified salt-glazed clay pipe is so hard that the grit in sewage can't erode it. Clay pipe never softens and sags out of round. Cleaning tools don't cut or scratch it. Clogging roughness can't develop to catch dirt and slow the flow.
To be sure of pipe that can take it... Specify Clay
cpa CLAY PRODUCTS ASSOCIATION
100 North LaSalle St., Chicago 2, Ill.

Engineering Societies Personnel Service, Inc.

New York Chicago Detroit San Francisco

84 East Randolph St., Chicago 1, Ill., STate 2—2748

These items are from information furnished by the Engineering Societies Personnel Service, Inc., Chicago. This SERVICE, operated on a co-operative, non-profit basis, is sponsored by the Western Society of Engineers and the national societies of Civil, Electrical, Mechanical and Mining and Metallurgical Engineers. Apply to ESPS, Chicago and the key number indicated.

POSITIONS AVAILABLE

Include postage to cover forwarding and return of application. If placed in a position as a result of an Engineers Available or Position Available advertisement, applicants agree to pay the established placement fee. These rates are available on request and are sufficient to maintain an effective non-profit personnel service. Prepared ENGINEERS AVAILABLE advertisements, limited to 40 words with typed resume attached, may be submitted to ESPS, Chicago, by members of Western Society of Engineers at no charge. A weekly bulletin of positions open is available to subscribers. Apply ESPS, Chicago.

6374-(b) SALES MANAGER, grad, engr., 30-40; 5-15 years' sales engrg. exp. and contacts in steel on heavy manufacturing industry. Developing sound sales program and building sales force for manufacturer of blast furnaces and allied equipment. $7,000-$10,000. Location: Chicago.

6379-CHIEF ENGINEER-DESIGNER, Grad. M.E., 35-40; must have exp. in permanent mold or die cast design. Take charge of engineering design dept. for a manufacturer of aluminum permanent mold-castings. Salary open. Location: Chicago.

6360-Y-3430. PRODUCTION SUPT. 30-40; mech. or industrial grad. Two to three years' exp. in supervision, scheduling of work, time and methods procedures for metal working industry. Salarl $4500-$5000 a year. Location: Midwest.

6365-RESEARCH DESIGNER (fuses) E.E. or M.E. 28-35; previous exp. in creative design, theory and construction of fuses. Must have high scholastic average and be able to deal with theoretical and high-level techniques. Previous employment with fuse manufacturer preferable. Salary open. Location: Midwest.

6368-TRADE ORGANIZATION FIELD REPRESENTATIVE, engineering background, 40; 10-15 years' exp. with Gypsum production, uses and application. Knowledge of Gypsum grades, locations, mining, milling, lab. plastering, etc. Contact distributors, survey field for possible uses and investigate applications. Must know and have ability to recognize and correct plastering problems. Salary open. Location: Chicago headquarters.

6377-PROJECT ENGINEER, B.S. in M.E. preferable. Will consider older man if exp. is good. On heavy duty transmission, design, layout work, checking, work closely with shop. Salary $400-$500. Location: Midwest.

6362-(a) PATENT ENGINEERS, (2) E.E., Che., M.E., Registered patent attorney, able to prepare and prosecute applications for U.S. and foreign patents. Salary open. Location: Chicago.

6362-(b) RESEARCH INVESTIGATOR (foreign trademarks) familiar with methods and procedures in conducting searches and filing foreign trademarks investigations. Salary open. Location: Chicago.

6370-INDUSTRIAL ENGINEER, 35; 1 year or more exp. with time study costs, estimates, methods, etc. on sheet metal fabrication; knowledge of shearing, forming, spraying, and press brake operations required. Standard data and wage incentive for a metal cabinet manufacturing company. About 50 employees. Salary $350-$400. Company will pay ½ fee. Location: Chicago.

ENGINEERS AVAILABLE

MECHANICAL & STRUCTURAL ENGR. Total of 35 years' exp. Have designed structural steel and reinforced concrete for mill buildings, office buildings, retaining walls, pits, also piping and ventilating ducts for power plants. Chicago only. 295-W.

SPARK TESTER, Inspector of Steel. 10 years' exp., desire consulting work spark testing in addition to present position. 296-W.

ELECTRICAL ENGINEER, JR. B.S. in E.E. 25. Female. Three years subprofessional level—primarily air borne radio and television. Desires laboratory work, calculating or technical writing. $2750. Chicago preferred. Can re-locate. 297-W.

MINING ENGINEER, E.M. 29; 2 years of mine surveying. Desires engineering in connection with mines or surveying. $3000-$3300. Any location. 298-W.

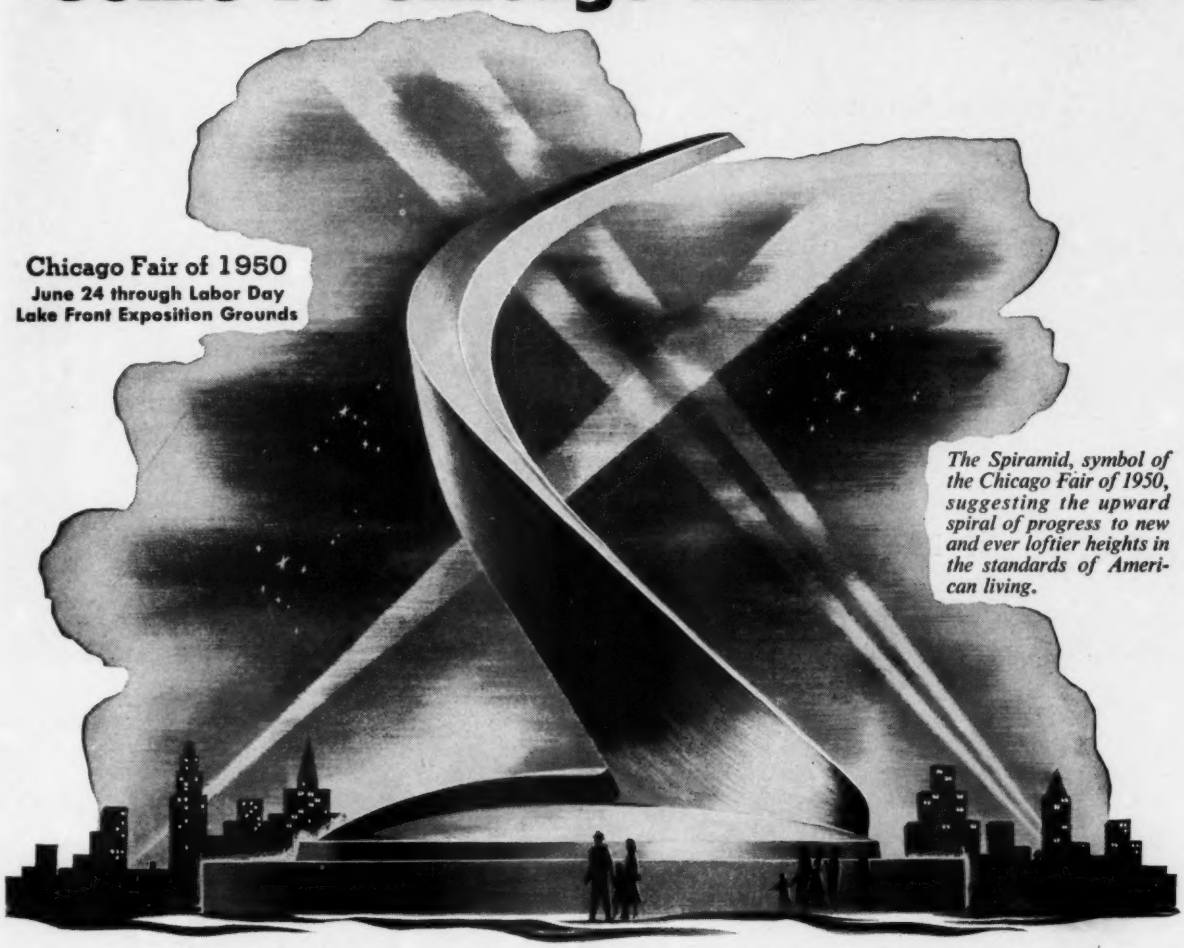
METALLURGICAL ENGINEER or ASSISTANT FOUNDRY SUPERINTENDENT, B.S. in Met. E. 28 years old. Seven years' exp. in non-ferrous foundry research and production, quality control, rigging, and estimating. $4500. Prefer Chicago area. 299-W.

BATES & ROGERS
CONSTRUCTION CORPORATION
600 W. Jackson Blvd.
CHICAGO 6
—
CIVIL ENGINEERS AND
GENERAL CONTRACTORS

SARGENT & LUNDY
ENGINEERS
140 S. DEARBORN STREET
CHICAGO, ILLINOIS

DE LEUW, CATHER & COMPANY
Consulting Engineers
Transportation, Public Transit and Traffic Problems
Industrial Plants — Grade Separations
Railroads — Expressways
Subways — Tunnels
Power Plants — Municipal Works
150 N. WACKER DRIVE, CHICAGO 6, ILL.

Come to Chicago this Summer



The Spiramid, symbol of the Chicago Fair of 1950, suggesting the upward spiral of progress to new and ever loftier heights in the standards of American living.

This Fair will dramatize many phases of achievement in agriculture, commerce, industry and science in the United States. Planned as an exposition of the "American Way" of life, its features will be highlighted by a spectacular pageant, "Frontiers of Freedom", dramatizing America's pioneer heritage.

Starting with the Columbian Exposition in 1893 and continuing through the Century of Progress in 1933 and '34 and the Railroad Fairs of 1948 and '49, Chicago has a record of consistent successes in staging these great exhibitions . . . commemorating historic occasions and dramatic achievements of industry. The fair planned for 1950, while unlike any previously presented here, will uphold this city's tradition for outstanding events of this sort.

Diversified skills and technological advances are potent factors in the industrial and agricultural growth of the Chicago-Northern Illinois area. This area, strategically located, rich in easily accessible natural resources, is a fertile proving ground of successful industry.

We will gladly prepare for you a confidential survey of the benefits of locating in the Chicago-Northern Illinois area, as they apply specifically to the problems and basic requirements of your business. There is no obligation, of course.

Industries in the Chicago area have these outstanding advantages: *Railroad Center of the United States • World Airport • Inland Waterways • Geographical Center of U. S. Population • Great Financial Center • The "Great Central Market" Food Producing and Processing Center • Leader in Iron and Steel Manufacturing • Good Labor Relations Record • More than 2,500,000 Kilowatts of Power • Tremendous Coal Reserves • Good Government • Good Living • Good Services for Tax Dollars.*

TERRITORIAL INFORMATION DEPARTMENT

Marquette Building—140 South Dearborn Street, Chicago 3, Illinois—Phone RAndolph 6-1617

COMMONWEALTH EDISON COMPANY • PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS
WESTERN UNITED GAS AND ELECTRIC COMPANY • ILLINOIS NORTHERN UTILITIES COMPANY

Any Structure of

Fabricated Structural Steel

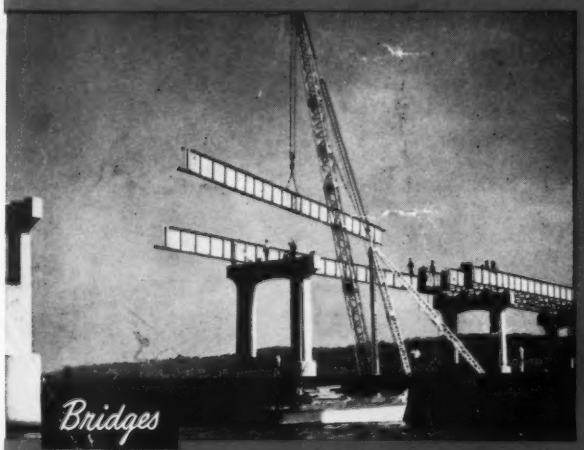
is a Job for ALLIED

These steel structures are good examples of Allied's versatility in meeting today's specialized building needs. Here specialized skill of workers in the plants "pays off" in steel for a river bridge, industrial and educational buildings . . . the mass tonnage fabricated to exact specifications and delivered on schedule.

Of course, complete mechanical equipment in Allied's 3 plants lends wings to all fabrication operations. Offers, too, cost-saving advantages interesting to those who contemplate building. Send your plans and specifications to us for estimating.

School Buildings

Crews moved "super-fast" to fabricate and deliver steel on schedule for the Hinsdale, Ill. school.



Bridges

5000 Tons of steel were erected by Allied for this huge bridge at Peoria, Illinois.

Industrial Buildings

Casting plant of Aluminum Co. of America, Hillside, Ill. 2000 tons were fabricated and erected.

Air Line Pilots Headquarters

Allied's 3 plants, operating as one fabricator, turned out steel for this Chicago Air Line Pilot's Administration Building.

ALLIED STRUCTURAL STEEL COMPANIES

Engineers • Fabricators • Erectors

20 N. WACKER DRIVE, CHICAGO 6, ILLINOIS

Divisions:

Clinton Bridge Corporation

Gage Structural Steel Corporation

Midland Structural Steel Corporation